Specialized Oil Publications of
THE GULF PUBLISHING COMPANY

The OIL WEEKLY and The COMPOSITE CATALOG for the drilling-producing-pipeline industry

PETROLEUM REFINER and The REFINERY CATALOG for the refining-natural gasoline industry

LOOKING AHEAD
. . . with the Editor

TO THE EXTENT that today's reflection seismograph prospects are the oil fields of tomorrow, it is possible to predict drilling performance in advance with some accuracy, after analysis of performance over the past 15 years. With this type of exploration currently dominant in the Gulf Coast, and at an all-time high, it is an appropriate time to evaluate the factors involved in balancing wildcatting risks against probable discovery volume for 1944 in this province; and to reach conclusions as to fulfillment of objectives by the reflection seismograph technique. An authoritative article by E. E. Rossaire on this important subject will be published in a forthcoming issue of THE OIL WEEKLY.

THE OIL MAN'S CALENDAR

APRIL 3- 4	Interstate Oil Compact Commission, New Orleans.
10-12	National Association of Corrosion Engineers, Annual Meeting, Rice Hotel, Houston.
12-14	Natural Gasoline Association of America, Baker Hotel, Dallas.
13-14	American Petroleum Institute, Eastern District, Division of Production, Columbus, Ohio.
24-25	National Oil Scouts and Landman's Association, Dallas.
27-29	Independent Petroleum Association of America, Bradford, Pa.
MAY 8-10	Regional Meeting, American Institute of Mining and Metallurgical Engineers, including Petroleum Division, Rice Hotel, Houston.
8-10	National Oil and Gas Power Conference (Oil and Gas Division, Power Division) ASME, Tulsa.
25-26	Spring Meeting, Mid-Continent District, API, Division of Production, Mayo Hotel, Tulsa.
JUNE 13-14	Spring Meeting, Southwestern District, API, Division of Production, Rice Hotel, Houston.
OCT. 12-13	Texas Mid-Continent Oil & Gas Association, Houston.
NOV. 13-16	American Petroleum Institute, Stevens Hotel, Chicago.

THE OIL WEEKLY

ENGINEERING « NEWS » STATISTICS

Published by THE GULF PUBLISHING COMPANY, Houston, Texas

R. L. DUDLEY, *President, Publisher* A. L. BURNS, *General Manager*

TOM W. NELSON, *Advertising Manager*

ADVERTISING STAFF

DICK SWINSKY.....New York
C. L. HASKINS.....Cleveland
H. G. FITZPATRICK.....Chicago
J. F. CARTER, JR.....Tulsa
J. W. CURTS.....Los Angeles
CHAS. WYATT.....Houston

BRANCH OFFICES

NEW YORK.....250 Park Ave. (17)
CLEVELAND.....1010 Euclid Ave. (15)
PITTSBURGH.....429 Fourth Ave. (19)
CHICAGO.....332 S. Michigan Ave. (4)
LOS ANGELES.....W. W. Wilson Bldg. Huntington Park, Calif.
TULSA.....Hunt Bldg. (3)
FORT WORTH.....W. T. Waggoner Bldg.
WASHINGTON.....Albee Bldg. (5)

CIRCULATION DEPARTMENT

G. D. CROFTON.....Manager

ABC

Member Audit Bureau of Circulation and Associated Business Papers, Inc.

ABP

EDITORIAL STAFF

WARREN L. BAKER
Editor

J. KENT RIDLEY
Managing Editor

SILAS B. RAGSDALE
News Editor

L. J. LOGAN
Associate Editor

DISTRICT EDITORS

B. F. LINZ.....Washington
H. H. KING.....Fort Worth
ANTHONY GIBBON.....Tulsa
R. W. BYRAM.....Austin
E. S. BUNCH.....Los Angeles
ELTON STERRETT, RIVERS REAVES, A. R. McTEE, DON L. CARROLL, TOM L. TURNER.....Houston

Contents . April 3, 1944

Volume 113 No. 5

The Changing Panorama..... 23

Technical and Feature Section:

Industry Asks PAW to Intercede in Critical Manpower Problem.. 25
Effects of War on Gasoline Consumption..... 26
Companies Give Stockholders Their Views on Reserves and Prices. 27
Evaluation of Material Balance Equations for Calculating Original Residual Oil Reserves in Place..... 28
Petroleum Possibilities in Szechuan Province, China..... 38

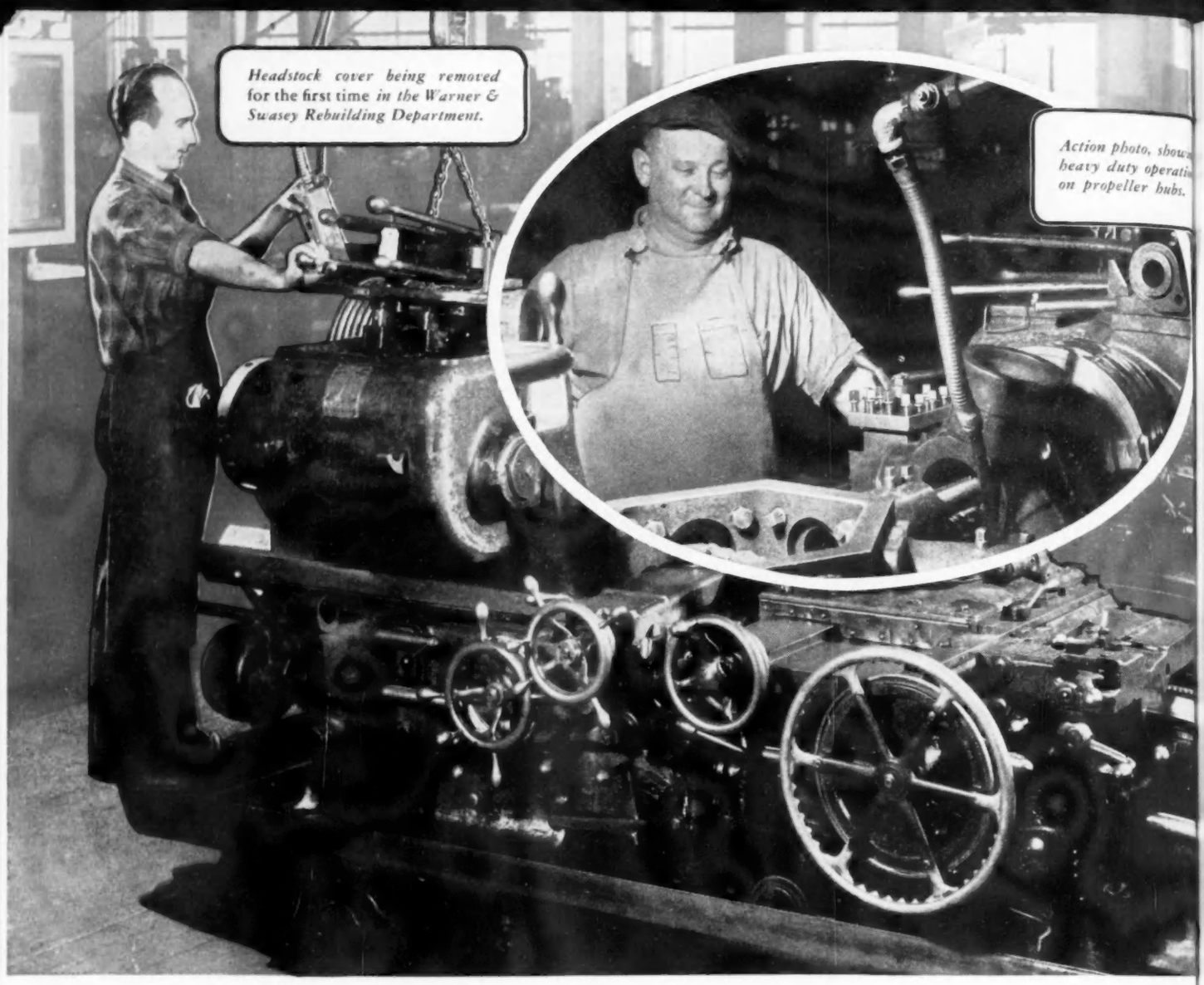
News and Departments:

Looking Ahead with the Editor..... 21
Washington Roundup..... 49
Markets, Statistics and Prices..... 62
United States Field Operations..... 69
United States Well Completions..... 81
United States Wildcat Starts..... 92
Squeaks from the Bull Wheel..... 94
Men in the Industry's News..... 96
Index to Advertisers..... 96

CENSORSHIP NOTICE—Censorship rules occasionally make it necessary to tear out or otherwise delete parts of publications destined to subscribers outside the United States. If there be such deletions in copies of THE OIL WEEKLY going abroad, they are at the request of the Office of Censorship. Copies sent abroad face unavoidable delay because of time necessarily consumed in passing the publication through the Office of Censorship.—*The Publisher.*

Published Every Monday. Single Copies 15 cents (Except Special Issues). Subscription price: domestic and foreign, $2.00 a year; 2 years, $3.00. Advertising rates on application.

Copyright 1944 by The Gulf Publishing Company.


Headstock cover being removed for the first time in the Warner & Swasey Rebuilding Department.
Action photo, showi heavy duty operati on propeller hubs.

How's this for a Service Record?

GOOD CARE PAYS DIVIDENDS

THIS Warner & Swasey 4A Turret Lathe, shown above, has had 25 years of service, crowded into a span of fourteen years.

Since it went into service for the Steel Products Engineering Company, Springfield, Ohio, early in 1930, it has been operating on *two continuous* 10-hour shifts—equivalent to 25 years' normal service. The work done involved heavy roughing cuts and finishing operations on aeroplane propeller hubs requiring an extremely heavy fixture. Surface polishing operations were performed at maximum spindle speeds.

During the fourteen years of continuous heavy duty service, the Steel Products Engineering Company maintained a policy of providing proper lubrication and correct adjustment on a regular schedule.

Until this 4A machine was returned to Warner & Swasey for inspection and rebuilding, the headstock cover had never been removed. Torn down in the rebuilding department of Warner & Swasey, internal parts were found to be in remarkably good condition, considering the long, hard service they had undergone.

Now we are rebuilding this turret lathe, getting it ready for another long life of productive usefulness. Its record is a tribute to the craftsmanship of the Warner & Swasey men who built it originally, and to the operators who gave this machine the proper care that good mechanics give good tools.

WARNER & SWASEY
Turret Lathes
Cleveland

YOU CAN TURN IT BETTER, FASTER FOR LESS . . WITH A WARNER & SWASEY

The Changing Panorama

PAW Said Seeking Funds for Expansion

WHEN appeals of various government bureaus for financial appropriations for the fiscal year beginning July 1 are made public, it will be revealed, according to reliable sources, that PAW has plans for substantial further expansion of its staff. This would be in direct contrast to the growing feeling within the industry that conditions have reached a point where it is desirable that some of PAW's work, and therefore its staff, should be reduced. It also would be in direct contrast with what PAW has lead the industry to expect.

Under the circumstances it is important that the industry, both individually and collectively, lose no opportunity to express its views during the coming few weeks and in advance of hearings held by appropriation committees in Congress.

PAW's budget appropriation justification report is said to show a desire to add 107 employees to its staff for which purpose an additional $500,000 is requested. This would boost the agency's payroll to 1479 and an annual expenditure in excess of $6,500,000.

It is understood that practically every department of the agency, from those dealing strictly with domestic issues to the foreign reserves and foreign refining divisions, has filed a lengthy statement with the appropriation committee in an effort to establish need for more men and more money. The general theme is understood to be that increased activities of the industry in trying to drill more wells, produce, refine and transport more oil make this expansion essential.

Natural Gas To Be More Valuable

OUTSTANDING among the things which are right now getting attention and which will receive even greater attention after the war is the matter of natural gas.

A new appreciation of the value of natural gas is permeating the industry. In the great gas areas of the Southwest impetus has been given to this interest by the increasing price natural gas is bringing under contract. Back in the Eastern areas natural gas has long been selling for prices which seem as fabulous to the Southwest gas producer as the gas potentials of the Southwest must seem to the individual gas producer in the East.

Most of the major companies list natural-gas processing as among the most important developments to come within the next ten years. We have talked to executives of major companies who tell us that such plans are engaging their attention right now.

New products will be taken from natural gas during the next few years. Natural gas as a fuel will be important, but equally important will be the constituents taken from it.

Recently we talked to one operator whose holdings include one of the biggest gas-distillate fields of the Coastal area. His company is engaged in experimental efforts, based upon previous German studies, which involve the manufacture of gasoline from methane. He says that if this effort is as successful as he thinks it will be, he has a billion barrels of gasoline in the gas in one field.

More and more we are hearing of the necessity of including gas reserves right along with crude oil reserves in figuring what the oil industry can deliver to take care of the nation's requirements. We have heard it said that in America gas reserves are almost equivalent to crude oil reserves in power and heat units.

Not long ago we heard that one company was seriously considering the liquefaction of natural gas at a Coastal point and its transportation by tanker to the Atlantic Seaboard. One tanker could carry the equivalent of 300,000,000 cubic feet of natural gas. Of course liquefaction of natural gas, and its storing in liquid form until needed, is not new—the idea has had practical application in the East.

Owners of gas properties will value them far more highly in the years to come than they do now.

Government statistics show that the valve industry has expanded its steel valve output to 7½ times its prewar annual output. Much of this valve output, absorbed in ship and other war work during 1943, again will be available for oil-field replacement and new installation requirements when shipbuilding demands slacken.

PAW Should Give Certain Controls Back to States

THE desire that PAW give back to state regulatory bodies the matter of well spacing is not confined to just a few operators. It is becoming almost universal.

The industry has been assured by the head of PAW that there is no intention to make government control of the oil industry permanent. Now, say operators, the situation has worked to the point where a better job can be done in the production branch if, in those states having spacing laws and regulatory bodies, those agencies take over again.

THE OIL WEEKLY proposed such a move sometime ago, with the provision that PAW, for the time being, continue to control spacing in those states having no regulatory laws and where exceptions to state spacing laws were involved. Ten days ago in Dallas, the American Association of Petroleum Geologists adopted a resolution urging PAW to return spacing to those states having spacing regulations. At about the same time, Governor Coke Stevenson of Texas dispatched letters to several other governors in which he informed them a similar resolution would be introduced at the Interstate Oil Compact Cimmission meeting in New Orleans on April 3 and 4. Seven days ago, a resolution of like nature was adopted by the industry's PAW District 3 Production Committee. These resolutions, in effect, parallel the suggestion made by THE OIL WEEKLY on March 6.

There is a fear that there are in PAW certain men who would like to see government control continue in one form or another. Peculiarly enough, some of the men whose names have been mentioned in connection, are men who before going to Washington were connected with large oil companies. THE OIL WEEKLY is not mentioning their names at this time because it is not sure that some of these men actually have the feeling attributed to them by others. Some of their actions may have been misinterpreted, or even erroneously reported. But THE OIL WEEKLY does believe that the time has come for PAW to take a new look at the situation, in the light of present

conditions and if possible begin the move away from government control back to industry control. This is particularly true in view of repeated statements that the production branch of the industry can do a better job, now that the material situation has been vastly improved under its own management than it can be expected to do under some of the PAW controls which have slowed down operations.

State Proceedings That Do Not Help

THOSE who atended the recent Wasson field gas-oil ratio hearing before the Texas Railroad Commission in Austin witnessed a scene that did nothing to encourage furthering the current agitation for dissolution of PAW and the return of oil regulatory rule to state agencies. For an open meeting at which a matter of interest to a number of parties was to be discussed, it was a peculiar session.

Witnesses saw what looked like too much partisanship on the part of commission members. Although approximately 90 percent of the wells in the field are complying with the state gas-oil ratio law, and owners of some of the other wells expressed willingness to correct their violations, one commissioner prompted a witness of the lone concern opposing an order that would require all wells to reduce their gas-oil ratio to the state maximum. During the meeting, another commissioner announced he had made up his mind, which was to oppose any change. Many obtained the impression that the commission was playing politics, perhaps because the protestor owns a prominent newspaper and is politically influential.

Another peculiar angle to the hearing was that all three of the commissioners were present and stayed through its duration, an unusual procedure, except for a statewide hearing.

"Expanding Circle"

ILLUSTRATIVE of the widening effect of expenditures on national economy are some statements made in an advance proof of an advertisement scheduled to be published in THE OIL WEEKLY during April by Union Wire Rope Corporation. That company has calculated the effect on the national economy of a three billion dollar postwar road building program and concludes, in a pie-chart, that such an expenditure would result in nine and one half billion dollars of business transactions.

Comments on "Needed—Real Diplomacy"

By RAY L. DUDLEY, Publisher

FROM a Houston subscriber commenting on the editorial entitled: "Needed . . . Real Diplomacy" (THE OIL WEEKLY, March 13) the paragraph reading in part *"If some British say that they paid a high price for it* (World War *oil*) . . ." was commented upon as follows:

"Not in dollars perhaps, but certainly in blood, sweat and tears. See British casualties of the First World War."

And another paragraph referring to lend-lease oil in the present war and *"whatever it may ultimately bring to the American taxpayer,"* was commented upon: "Perhaps it will bring victory, Mr. Dudley."

No one will deny for a moment that Britain paid a terrific price in blood, sweat and tears for the victory achieved in World War I nor will any sensible person deny that lend-lease oil has been playing a tremendous part in working toward victory for us as well as our allies in World War II. To this extent we are in thorough accord with the Houston subscriber.

What the Houston subscriber and many Englishmen sometimes forget is that the American people do not feel that a war is their war until our government has itself declared war. Much as our sympathy lay with the British people and powerful as an argument might be that even in the beginning of World War II Britain was waging a fight which was the battle of all democracies, the American people are unwilling to accept the theory that a war is our war until we have actually made it so by a declaration. To take a contrary position would mean that the American people would be expected to accept an English declaration of war as an American call to arms.

The writer has read with a great deal of interest the book recently published by Walter Lippmann on American Foreign Policy and is thoroughly in agreement with Mr. Lippmann that there should be a strong postwar alliance between English-speaking peoples, but we must realize that one of the most serious obstacles to such an alliance is the feeling on the part of many American people that Britain will possibly be dragged into wars in which the American people might feel no substantial interest. If our statesmen and British statesmen could arrive at an understanding which would build an alliance on the basis of mutual interests only, then such an alliance probably would be acceptable to the American people.

But our British friends do not serve their own purpose when they insist on a premise that the American people are to be expected to pay for the blood, sweat and tears of another people before we become allies in fact.

The editorial also asked the question, *"Is there then a reason why, in the operation of mandates in British-controlled territory, American interests should be blocked, thwarted and, by semi-official action eliminated from competition?"*

The subscriber comments: "Have we really been blocked in Saudi Arabia, Kuwait, Bahrein Islands or the Dutch East Indies by competition?"

We have not been blocked in acquiring properties in the areas referred to, but the writer is informed that efforts to move oil out of the areas by a pipe line owned by American interests have been thwarted and that by underlings of the very government with which we are now allied and with which we were allied in World War I. It is possible that these informants are mistaken.

It is probably too much to expect that two great peoples like the English and the Americans will ever reach a 100 percent agreement on all things but we submitted in the March 13 editorial that their paramount interests are such as to solve these vexatious problems by friendly consultation.

Which brings up another comment received on the editorial, this from a subscriber in Oklahoma City who stated that he agreed with the editorial completely until he got to the point where it suggested that the oil problem was imporant enough for Churchill and Roosevelt to settle it between themselves. He expressed the fear that the President would make a very poor trade with the Prime Minister. We have never handed President Roosevelt any laurels for his business trading ability, but, under our constitutional set-up, and under the present political set-up, he has already been designated to represent us and we do feel that something should be done to get the matter settled.

By doubling the number of inspection rounds on centrifugal pumps in gathering-line service, one company found that more frequent maintenance reduced the packing outlay by 40 percent, and cut the average shop maintenance time per unit by almost 60 percent.

PAW May Intercede in Critical Production Manpower Situation

IT BECAME clear last week that the recently announced decision to induct all men under 26 into the armed services made manpower the foremost problem of the industry, and with this came the realization that unless effective steps are taken immediately drilling and production activities may be curtailed drastically in coming weeks.

Facts and figures must be compiled immediately to present the true picture to PAW, which, in turn must lay the problem squarely in the laps of the War Manpower Commission and the heads of the armed services. Ultimate decision as to whether or not draft-age workers in oilfields are to be drafted must be made by the Army and Navy, and these services will have to accept the full responsibility. The industry itself must take steps to create a reservoir of needed labor, and to prevent drafting of any more vitally needed, physically able and experienced men. Otherwise, wells will not be drilled, fields will not be operated properly, and needed amounts of oil will not be forthcoming to answer military requirements.

As yet drafting of men in the production department has not curtailed production because companies have been able to lengthen working hours and replace drafted men with older workers. However, this cannot be continued, and this branch of the industry will be hard hit unless some program is instituted now to obtain replacements.

Drilling already has slowed down, being 25 percent behind a schedule of 24,000 wells annually. Much difficulty has been experienced for sometime in getting drilling crews. Physical requirements precluded the possibility of using women, and also men not capable of hard manual labor. Full crews are necessary before others can perform their tasks, and the necessity of making frequent moves has made it practically impossible to interest men in this type of work.

PAW May Intercede

From Washington came word that PAW may be authorized to endorse special requests for deferment of key men under 26 years engaged in production of oil and gas, including exploration, development and servicing. It is probable that no consideration for deferment of men in this age group will be given by selective service without PAW endorsement.

On the assumption that such action may be taken, PAW declared that it would not consider any requests for endorsement unless the following procedure is met:

1. Prepare and file 3 copies of SS Form 42A (Special) directly with office of Labor Counsellor, PAW, 6640 Interior Building, Washington, D. C., setting forth in detail the nature of the occupation, qualifications, irreplacibility, etc., of each registrant.

2. Also submit to the Labor Counselor 2 copies of "company certification" applying to all men for whom Forms 42-A (Special) are submitted, which must be signed by an officer of the company who will assume personal responsibility for the statements contained therein. This certification must state that the individual is employed 48 or more hours per week and cannot be replaced by others presently engaged on non-vital programs who are not immediately vulnerable to the draft, or cannot be replaced by recruitment.

3. If a replacement schedule and summary have been filed with the state headquarters of Selective Service, a copy of such replacement schedule and summary must be sent to the office of the Labor Counselor.

According to D. R. Knowlton, director of production, PAW cannot act on any case until the steps outlined above are complied with. Knowlton said "ability to retain key men will depend in part on the speed with which you take action on these steps."

District Operators Act

Representatives of District 3 operators and contractors meeting in Houston March 27 took steps they hoped would alleviate the problem.

The manpower subcommittee of the PIWC District 3 Production Committee made the following specific recommendations:

1. PAW to act as intermediary with Selective Service state headquarters in each state so as to give greater weight to replacement schedules filed by industry.
2. Industry prepare manpower picture of drilling and production employes showing same by age groups and critical and non-critical occupations.
3. Industry submit a schedule to PAW showing potential manpower needs for next six months.
4. War Manpower Commission to advise PAW of contemplated cutbacks in other war industries in advance so that drilling and production can carry on recruitment program.
5. Publicity to be given by District Three Production Committee, Petroleum Industry War Council, regarding urgent need for men in drilling and production.
6. The industry institute a manpower recruiting system to be staffed by voluntary members of the industry in various localities of District Three. It will be responsibility of these individuals to contact all U.S.E.S. offices in their assigned areas and enlist their cooperation in recruiting manpower for the drilling and production branch of the industry. The committee feels that the experience gained from this voluntary plan will indicate whether it is advisable to appropriate funds by the industry to put in operation a recruiting system for District Three for the duration of the emergency.

Manpower Questionnaires

It was decided by District 3 to gather, via questionnaires, accurate, up-to-date figures and opinions relating to manpower in drilling and production, to be used in obtaining cooperation of PAW officials, who will be asked to intercede for deferments of essential oil workers subject to draft.

These questionnaires, mailed last week to drilling contractors and producing companies, call for exact figures on possibilities of switching employes from one department to another, number of men in each of 5 age groups between 18 and 38 or over, number of 4-Fs, number of women employes, number of critical and non-critical workers, hours worked per week, number of rigs that would be shut down, or effect on daily production, if all men between 18 and 38 were drafted, percentage of men already lost by draft, extent to which United States Employment Service has been utilized in enlisting workers, and whether or not this service has supplied the required numbers. The questionnaire also solicits information regarding operation of the replacement schedule plan and the extent to which contractors and field operators are working on replacement schedules.

Recruitment of workers, it was decided, will be inaugurated immediately, and every legitimate means will be employed to attract them into the drilling branch, especially. A leading company will be asked to loan a personnel executive, familiar with requirements of workers in drilling and production branches, to serve as administrative head of the recruiting service, supervising the work of volunteer recruiters stationed at key local points throughout the district. All publicity media will be utilized in the drive; the facilities of the United States Employment Service likewise will be used, and men released from other industries as a result of production cutbacks will be rigorously canvassed as drilling crew prospects. This campaign will start immediately.

The recruiting problem in District 3 is much more complicated than on the West Coast, where the so-called "California Plan" has proved to be so effective. Southern California has been classed as a "critical labor shortage area" and consequently all industrial employment is handled exclusively through the offices of the United States Employment Service there. Oil industry representatives are provided desk space in these centers and have been able to enlist needed men for oil-field work.

This action represented an attempt to overcome a series of obstacles that has restrained drilling and producing branches of the industry in their effort to drill wells and get the oil out according to goals set by the government. Since it has been found that replacements cannot be furnished through activities of federal agencies, drillers and producers are agreed that they must act in their own behalf, in open competition with other essential industries seeking labor.

Effects of War on

Gasoline Consumption

By L. J. LOGAN, Associate Editor

IN REFLECTION of the fact that the United States now is using only about two thirds of its unprecedented gasoline output for normal purposes and one third for military purposes, the situation prevails wherein customary consumption has been running about 20 percent lower than in the Pearl Harbor period two years ago, although total demand is running around 10 percent higher than at that time, being at new record levels for this time of year.

Because of nation-wide rationing of gasoline in 1943, the national domestic consumption of gasoline during that year was approximately 20 percent lower than in 1941. This total decrease for the two-year period was the result of curtailment in use not only in 1943 but also in 1942, when disruption of transportation first forced restrictions on consumption by rationing in the large-consuming East Coast district.

Domestic consumption of 1941 represented an all-time record, and in 1942 there was a decrease of about 12 percent, followed by a further decrease of approximately 8 percent in 1943.

In 1944 there is a continuation of the subnormal domestic consumption, in spite of the fact that total demand is going into new high ground. That the domestic use will continue subnormal indefinitely now is assured by the recent extension of stricter rationing, placing all regions outside the East Coast district on the same lean rations as those in the Eastern area.

The above figures indicating that gasoline consumption in the United States decreased 12 percent in 1942 and 8 percent more in 1943 are based on accompanying taubulated data from the American Petroleum Institute, showing use in 46 states and the District of Columbia, data having been unavailable for Colorado and Oklahoma.

While the 46 states and federal district in the aggregate consumed 19.5 percent less gasoline in 1943 than in 1941, the changes in use as compared with two years ago varied widely among different states. The only states that did not show decreases, however, were California and Texas. California used 10 percent more gasoline in 1943 than in 1941 and Texas 57 percent more. These increases evidently are explainable by the fact that both states, as heavy producers and refiners of petroleum, were slow to come under strict rationing, and also by the more important fact that they have had great influxes of new civilian population as well as military personnel, with large proportions of the new inhabitants and many of the old residents entitled to and getting extra rations of gasoline by virtue of participating in the work involved in the numerous military and war production establishments set up there during the war.

Arizona consumed almost as much gasoline in 1943 as in 1941, and there were decreases of less than 10 percent in Mississippi, New Mexico, North Dakota, and Washington. Sub-average decreases of 10 to 20 percent were recorded for Idaho, Indiana, Kansas, Nebraska, Nevada, Oregon, South Dakota, Tennessee, and Utah. Average decreases of around 20 percent occurred in Alabama, Arkansas, Florida, Iowa, Louisiana, and Ohio.

Until the recent order placing the whole country on the same rationing basis, the states of the East Coast district experienced the most severe curtailment of consumption of gasoline, and among them, the New England states showed the largest decreases, while states toward the south and west generally suffered somewhat less, because of being nearer to sources of supply.

Changes in Gasoline Consumption by States Since Pearl Harbor

Data from American Petroleum Institute

(Thousands of Gallons)

STATE	†State Tax per Gal., Dec. 1943 (Cts.)	DECEMBER			Percent Change of 1943		YEAR			Percent Change of 1943	
		1941	1942	1943	From 1941	From 1942	1941	1942	1943	From 1941	From 1942
Alabama	6	28,564	16,857	22,975	— 19 6	+ 36 3	328,414	309,800	261,351	— 20 4	— 15 6
Airzona	5	12,492	8,992	14,062	+ 12 6	+ 56 4	128,157	127,207	127,793	— 0 3	+ 0 5
Arkansas	6½	21,262	13,894	15,015	— 29 4	+ 8 1	224,278	206,773	179,443	— 20 0	— 13 2
California	3	201,760	178,799	242,381	+ 20 1	+ 35 6	2,241,085	2,235,256	2,460,630	+ 9 8	+ 10 1
*Colorado	4										
Connecticut	3	36,074	23,151	23,432	— 35 0	+ 1 2	421,468	337,459	260,371	— 38 2	— 22 8
Delaware	4	5,667	3,553	4,027	— 28 9	+ 13 3	68,118	54,607	48,979	— 28 1	— 10 3
D. of Columbia	3	17,044	10,161	9,218	— 45 9	— 9 3	191,552	149,733	105,544	— 44 9	— 29 5
Florida	7	44,815	36,116	31,878	— 28 9	— 11 7	475,696	441,126	366,450	— 23 0	— 16 9
Georgia	6	40,221	26,615	30,187	— 24 9	+ 13 4	449,933	382,019	333,488	— 25 9	— 12 7
Idaho	5.1	8,490	5,492	7,670	— 9 7	+ 39 7	117,011	106,102	96,441	— 17 6	— 9 1
Illinois	3	133,209	63,747	93,793	— 29 6	+ 47 1	1,637,445	1,415,704	1,164,582	— 28 9	— 17 7
Indiana	4	67,038	40,835	56,553	— 15 6	+ 38 5	821,703	741,625	672,601	— 18 1	— 9 3
Iowa	3	47,605	29,258	36,140	— 24 1	+ 23 5	612,269	543,939	483,220	— 21 1	— 11 2
Kansas	3	39,999	23,453	29,453	— 26 4	+ 25 6	540,622	487,206	437,079	— 19 2	— 10 3
Kentucky	5	28,372	17,637	19,867	— 30 0	+ 12 6	333,417	281,314	237,270	— 28 8	— 15 7
Louisiana	7	28,194	15,927	24,224	— 14 1	+ 52 1	343,508	301,619	273,210	— 20 5	— 9 4
Maine	4	12,996	8,723	9,330	— 28 2	+ 7 0	173,811	133,895	111,709	— 35 7	— 16 6
Maryland	4	32,263	22,805	24,232	— 24 9	+ 6 3	365,521	313,434	270,663	— 26 0	— 13 6
Massachusetts	3	67,206	43,396	45,407	— 32 4	+ 4 6	804,496	607,089	488,666	— 39 3	— 19 5
Michigan	3	112,221	65,752	81,034	— 27 8	+ 23 2	1,392,274	1,201,730	978,851	— 29 7	— 18 5
Minnesota	4	46,305	32,472	34,692	— 25 1	+ 6 8	608,213	547,244	442,449	— 27 3	— 19 1
Mississippi	6	23,326	20,041	22,614	— 3 1	+ 12 8	258,833	255,327	234,522	— 9 4	— 8 1
Missouri	2	65,649	35,269	34,815	— 47 0	— 1 3	775,837	644,095	518,855	— 33 1	— 19 4
Montana	5	9,738	6,947	7,540	— 22 6	+ 8 5	148,387	126,907	110,268	— 25 7	— 13 1
Nebraska	5	18,999	13,266	16,517	— 13 1	+ 24 5	251,545	234,926	215,390	— 14 5	— 8 3
Nevada	4	3,945	3,334	5,426	+ 37 5	+ 62 7	49,753	48,721	42,272	— 15 0	— 13 2
New Hampshire	4	7,832	4,900	4,875	— 37 8	— 0 5	102,038	77,575	54,805	— 46 3	— 29 4
New Jersey	3	84,951	55,739	62,980	— 25 9	+ 13 0	1,007,629	808,128	663,834	— 34 1	— 17 9
New Mexico	5	9,380	6,792	8,169	— 12 9	+ 20 3	109,973	98,647	99,564	— 9 5	+ 0 9
New York	4	165,063	110,105	113,369	— 31 3	+ 3 0	2,058,071	1,585,338	1,261,565	— 38 7	— 20 4
North Carolina	6	48,308	30,078	33,652	— 30 3	+ 11 9	542,774	425,540	382,717	— 29 5	— 10 1
North Dakota	4	10,389	7,346	8,403	— 19 1	+ 14 4	165,782	164,996	154,271	— 6 9	— 6 5
Ohio	4	140,136	88,917	108,833	— 22 3	+ 22 4	1,639,314	1,472,565	1,250,830	— 23 7	— 15 1
*Oklahoma	5½										
Oregon	5	24,699	16,373	19,023	— 23 0	+ 16 2	303,646	279,815	253,166	— 16 6	— 9 5
Pennsylvania	4	144,146	86,864	96,659	— 32 9	+ 11 3	1,704,947	1,389,068	1,065,936	— 37 5	— 23 3
Rhode Island	3	11,906	9,873	9,797	— 17 7	— 0 8	147,280	119,231	103,527	— 29 7	— 13 2
South Carolina	6	23,924	15,250	16,846	— 29 6	+ 10 5	275,320	217,950	188,661	— 31 5	— 13 4
South Dakota	4	11,151	9,601	9,736	— 12 7	+ 1 4	152,624	143,612	130,599	— 14 4	— 9 1
Tennessee	7	39,964	26,808	24,756	— 38 1	— 7 7	385,816	360,816	318,114	— 17 5	— 11 8
Texas	4	135,690	98,671	263,008	+ 86 5	+156 4	1,673,237	1,741,021	2,624,740	+ 56 9	+ 50 8
Utah	4	8,903	8,578	8,325	— 6 5	— 2 9	116,893	113,287	102,130	— 12 6	— 9 8
Vermont	4	5,639	3,293	3,569	— 36 7	+ 8 4	75,189	53,859	41,157	— 45 3	— 23 6
Virginia	5	44,116	25,461	27,631	— 37 4	+ 8 5	497,356	403,026	342,498	— 31 1	— 15 0
Washington	5	38,697	27,166	29,750	— 23 1	+ 9 5	441,440	443,897	403,082	— 8 7	— 9 2
West Virginia	5	20,160	13,965	14,389	— 28 6	+ 3 0	240,188	195,900	152,302	— 36 6	— 22 3
Wisconsin	4	49,214	31,243	37,548	— 23 7	+ 20 2	636,223	571,435	465,526	— 26 8	— 18 5
Wyoming	4	5,571	3,389	4,366	— 21 6	+ 28 8	79,049	61,767	52,961	— 33 0	— 14 3
Total, 46 States & D.C.	...	2,183,293	1,446,904	1,838,166	— 15 8	+ 27 0	26,118,135	22,962,330	21,034,082	— 19 5	— 8 4
Daily Avg.	..	70,429	46,674	59,296	— 15 8	+ 27 0	71,557	62,910	57,628	— 19 5	— 8 4

* Data not available. † In addition to these state taxes, there is a Federal tax of 1½ cents per gallon.

Daily Average Total Demand for Gasoline 12.7 Percent Higher in February, 1944, Than in February, 1942, as Increase in Military Needs More Than Offsets Curb of Normal Use

(Thousands of Barrels)

DATA ON GASOLINE	FEBRUARY				Percent Change '42-'44	FIRST 2 MONTHS				Percent Change '42-'44
	1941	1942	1943	1944		1941	1942	1943	1944	
Production (straight run cracked, natural blended)	46,841	49,688	41,699	54,801	+10 3	98,014	108,088	86,824	110,255	+ 2 0
(Daily Average)	1,673	1,774	1,488	1,890	+ 6 5	1,661	1,832	1,472	1,838	+ 0 3
Imports	452					452				
Change in Stocks, Finished	+5,387	+6,697	+4,392	+4,633		+10,754	+13,773	+12,095	+10,036	
Stocks, Beginning of Period	83,310	93,489	78,475	70,367	—24 7	77,943	86,413	70,772	64,964	—24 8
Stocks, End of Period	88,697	100,186	82,867	75,000	—25 1	88,697	100,186	82,867	75,000	—25 1
Demand (Excl. Small Imports)	41,454	42,991	37,307	50,168	+16 7	87,260	94,315	74,729	100,219	+ 6 2
(Daily Average)	1,481	1,535	1,332	1,730	+12 7	1,479	1,599	1,267	1,670	+ 4 4

Companies Give Stockholders Their Views on Reserves and Prices

Aiding war effort considered first regardless of what cost may be; price increase declared needed

By A. R. McTEE, Staff Writer

ALTHOUGH the immediate problem of supplying enough crude oil to meet all military and civilian needs may become acute, it is the opinion of the heads of many leading oil companies that future generations will not suffer lack of the comforts provided by oil, for there is no real shortage. It is their belief, according to statements in annual company financial statements to stockholders, that the present tight situation and discrepancy between demand and supply is a direct result of the war and will be corrected as soon as the war ends, unless the initiative and courage of American enterprise is chilled by future political trends.

Alarms set off by failure of new discoveries to balance annual consumption are held unjustified, since a combination of factors inherent in the war limits the industry's ability to increase its total output of petroleum products. This is not indicative of any prolonged or permanent shortage of oil as has been suggested in some quarters according to views expressed in most of the annual financial reports. Low prices for crude oil is held largely responsible for the downward trend in the discovery of new reserves. This long-range view of reserves should be of comfort to the American public at a time when there is a real belief of shortages in many quarters.

Pointing backward to "similar contentions made periodically since America first became a 'nation on wheels'," the annual report of Sun Oil Company for 1943 declares that in the last two decades we have consumed almost three times as much oil as "Cassandras of the twenties said we possessed at the beginning of the period." Even during 1943 when production reached a new peak, the reserve total of 20,082,793,000 barrels was not substantially affected.

"Misunderstanding of the true situation," the report urges, "grows out of mistaken or loose interpretation of the term 'estimated proved reserves.' Too often the figure of approximately 20 billion barrels is used to mean an estimate of oil under the earth's surface in this country. Actually the 20 billion barrel figure is probably but a fraction of the oil under American land and water. The 'estimated proved reserves' figure is a technical term based on a formula confined to reserves proved by sharply defined drilling and production performance. It does not include reserves that are present in the undrilled areas of partly developed fields; nor does it include reserves in untested formations below producing sands in developed and partly developed fields; nor does it include additional oil that might be obtained as a result of installing gas drive or water drive in pools not now so equipped; nor does it take into consideration additional reserves available from millions of acres of land as yet untested, but regarded as favorable from the geological standpoint for accumulation of oil."

Advising the use of care in comparisons of annual consumption and the amount of reserves discovered through new pools, the Sun Oil Company report states that too much has been made of this difference. It is misleading to rely solely upon oil reserves acquired through "New Pools Discovered" as an index of our future supplies. "In the case of new discoveries," it is explained, "where only a few wells have been completed, estimates of the total quantity of oil contained in the pool, when made shortly after discovery, are hazardous and subject to error. For this reason the American Petroleum Institute's Committee on Petroleum Reserves assigns a relatively small area to such a pool, but not without full realization that subsequent drilling may extend the area and the quantity of oil in the pool. When this development takes place and reveals additional oil, the estimate of proved reserves for such field is accordingly increased under a label of 'Revision of Previous Estimates and Extensions to Known Fields.' Reserves acquired in this manner are just as much additions to the country's total reserves as are those resulting from 'New Pools Discovered,' and, in fact, usually greatly exceed the latter estimates."

No Shortage Seen

Substantiating the view held by Sun Oil Company, The Standard Oil Company of Ohio suggests that "Probably many members of the public have got the impression that the industry is faced with an immediate, critical problem in the respect of a petroleum shortage." The truth however "would seem to be that apart from meeting the special supply problems brought on by the war, there is no such degree of imminence in the problem of future crude oil supply for our country as appears to have been imagined or suggested by some people."

The recent report of the Committee on Reserves of the American Petroleum Institute is cited as evidence. "This report shows that in spite of the fact that during the last year our current production has been greater than ever before, the estimated proved reserves discovered in 1943 in new pools and in extensions and new horizons in old pools approximately equaled the year's production, so that the proved reserves at the end of the year remained at approximately the same level as the year earlier, which was the highest level for all time. This level, which is slightly in excess of 20 billion barrels compares, for example, with a level of approximately 13 billion barrels at the beginning of 1936. The committee commented that 'there is no doubt of the existence of great reserves of crude oil not yet discovered or proved . . . Every year new and important discoveries have been made and there is no reason to believe this trend shall suddenly come to an end in the foreseeable future . . . there are vast areas yet unexplored that can produce oil.'"

The industry is capable of sustaining an efficient rate of production of more than 4,000,000 barrels per day for a number of years ahead, as indicated by studies made by the industry and government agencies.

No Immediate Emergency

The API report, in the opinion of The Standard Oil Company of Ohio, together with statements of other broadly conversant with the over-all problem, should serve to put the problem of crude-oil supply in its proper perspective as being a long-term matter and not one of immediate emergency. Real optimism is voiced in the report which says "It is indeed difficult to foresee a time in any near-term future period when our own domestic production, together with available imports from various other countries which have vastly greater reserves than their own consumption needs require, cannot fully meet all of our normal petroleum requirements."

The Texas Company does not share in the bright picture outlined by the two companies above. On the contrary, the rate of production achieved in 1943 is not projected beyond this year. "It is the management's opinion that this annual amount of production, approximately 1½ billion barrels, can probably be maintained through the year 1944, but we believe that such production is the maximum that can be attained and that in the year 1945 the country can anticipate the beginning of a substantial decline in its ability to produce crude oil unless some large discoveries are made in the United States.

"No new fields of any great importance were discovered in 1943. The withdrawal of 1½ billion barrels from crude-oil reserves was largely replaced by discoveries made in deeper horizons in existing fields, extensions made in such fields, and the revisions of estimates of crude-oil reserves in known fields."

Emphasizing the downward trend in discovery of new reserves, the year 1939 was pointed out as the beginning of this decline. "Since that year," the report goes on, "reserves have largely been maintained by extensions to and deepening of existing fields. The year 1943 from the standpoint of important discoveries of new fields was disappointing."

Prevailing conditions have forced the management of The Texas Company to these conclusions:

1. Unless there is developed an entirely new or improved technique for locating deposits of oil, new discoveries will be less frequent and new production will be more costly than in the past.

2. Unless new important reserves are discovered in the United States, this country must become a substantially larger importer of petroleum in order to

• CONTINUED ON PAGE 36

Equivalence of Material Balance Equations For Calculating Original Residual Oil Reservoir in Place

This Penn State Reservoir Engineering Study by Sylvain J. Pirson* shows discrepancy between Schilthuis and Katz methods as due to inclusion of more numerous steps in Katz' formulae, thereby affording more changes for cumulative errors to register appreciable effect on final answer

IT IS generally believed by reservoir engineers that the various formulae which have been proposed for the calculation of oil originally in place in a reservoir are not equivalent and, in fact, sample calculations illustrating the use of the Schilthuis[1] and Katz[2] methods to particular cases would indicate that the two methods give results varying by as much as 20 percent. It is proposed to show that, on theoretical grounds, the methods of Schilthuis and Katz are identical and that the apparent discrepancy is due to the fact that the method of Katz includes more numerous steps in the calculation, thereby affording more chances for cumulative errors to register an appreciable effect in the final answer.

In order to prove the theoretical equivalence of the Schilthuis and Katz methods it is required to express both methods in a consistent system of notations. One of the limitations of the various articles thus far published on the subject matter of reservoir engineering has been the lack of unity in the system of notation used. It is proposed to use here a system which has already received some acceptance in the literature and which has the advantage of simplicity and of an actual physical meaning.

Notations

N: Number of units of residual oil (no dissovled gas) in cubic feet originally present in the reservoir.

n: Number of units of residual oil in cubic feet produced to a given time.

m: Fraction of the oil reservoir volume originally occupied by gas.

P_o: Original absolute bottom-hole pressure (pounds per square inch), before any production began.

p: Absolute bottom-hole pressure (pounds per square inch) at the time when n units of residual oil have been produced.

β_o: Initial reservoir volume of one unit of residual oil with its complement of dissolved gas at P_o. (Figure 3).

β: Reservoir volume of one unit of residual oil with its complement of dissolved gas at p. (Figure 3).

α_o: Reservoir volume of one unit of gas at standard conditions of temperature (60°F.) and pressure (14.7 pounds per square inch) when subjected to reservoir pressure (P_o) and temperature (T_b).

Thus: $\alpha_o = \frac{14.7}{P_o} \times \frac{T_b}{520} \times Z_o$

where Z_o is the supercompressibility coefficient of the produced gas under a pressure of P_o. (Figure 2).

α: Reservoir volume of one unit of gas at standard conditions of temperature (60°F.) and pressure (14.7 pounds per square inch) when sub-

Step No.	Explanation	Formula
1	Crude oil produced	n
2	Gas produced	nr_n
3	Bottom hole pressure	p
4	Gas dissolved in crude	S
5	Gas evolved	$S_o - S$
6	Correction factor for deviation from ideal gas	$Z = \frac{pV}{RT}$
7	Dissolved gas in produced crude oil	nS_o
8	Excess gas produced	$n(r_n - S_o)$
9	Vol. of 1 sd. ft.³ of gas at reservoir conditions	$\alpha = \frac{14.7}{p} \cdot \frac{T_b}{520} \cdot Z$
10	Vol. of produced oil and dissolved gas at reservoir conditions	$n\beta_o$
11	Vol. occupied by excess gas when dissolved in reservoir crude	$\frac{n(r_n - S_o)}{\frac{S_o - S}{\beta_o - \beta}}$
12	Net reservoir volume of total oil and gas produced	$n\beta_o + \frac{n(r_n - S_o)}{\frac{S_o - S}{\beta_o - \beta}} - (W - w) - mN\beta_o\left(\frac{\alpha}{\alpha_o} - 1\right)$
13	Vol. of gas in the gas cap (evolved from crude oil)	$(\text{Step 12}) \cdot \frac{\frac{S_o - S}{\beta_o - \beta}}{\alpha \frac{S_o - S}{\beta_o - \beta} - 1} = (\text{Step 12}) \cdot \frac{S_o - S}{\alpha(S_o - S) - (\beta_o - \beta)}$
14	Crude necessary to produce gas cap gas (of step 13)	$\frac{(\text{Step 13})}{S_o - S} = (\text{Step 12}) \cdot \frac{1}{\alpha(S_o - S) - (\beta_o - \beta)}$
15	Crude necessary to produce excess gas	$\frac{n(r_n - S_o)}{S_o - S}$
16	Total crude (residual) initially present	$N = n + \frac{n(r_n - S_o)}{S_o - S} + \frac{1}{\alpha(S_o - S) - (\beta_o - \beta)} \cdot \left[n\beta_o + \frac{n(r_n - S_o)(\beta_o - \beta)}{S_o - S} - (W - w) - mN\beta_o\left(\frac{\alpha}{\alpha_o} - 1\right)\right]$
17	Initial vol. of gas when dissolved in crude	$N(\beta_o - 1)$
18	Initial fluid present in reservoir (including initial gas cap volume)	$N\beta_o + mN\beta_o$

TABLE 1

* Of the Petroleum and Natural Gas Engineering Department, The Pennsylvania State College, State College, Pennsylvania.

jected to reservoir pressure (p) and temperature (T_b).

Thus: $\alpha = \frac{14.7}{p} \times \frac{T_b}{520} \times Z$

since it is assumed that the production process is isothermal and no appreciable temperature change occurs when oil and gas are removed from the reservoir. Z is the supercompressibility factor for the produced gas under a pressure of p. (Figure 2).

S_o: Solubility of gas in oil on a unit per unit basis (standard cubic foot of gas per cubic foot of residual oil) at pressure P_o. (Figure 3).

S: Solubility of gas in oil on a unit per unit basis (standard cubic foot of gas per cubic foot of residual oil) at pressure p. (Figure 3).

r_s: Net average gas-oil-ratio in standard cubic foot of gas per unit (cubic foot) of residual oil. The net gas-oil-ratio is the difference between the gross or produced gas-oil-ratio and injected or recycled gas-oil-ratio.

W: Total number of units (cubic foot) of water which encroached into the reservoir during the production of the n units of residual oil.

w: Total number of units (cubic feet) of water produced with the n units of residual oil.

W-w: Net water encroachment into the reservoir.

Simple Derivation of Schilthuis' Equation

Schilthuis' equation expresses a very simple relation which exists at all times in an oil and gas reservoir and which can be arrived at very simply by considering an idealized reservoir volume as shown in Figures 1a and 1b. Figure 1a shows the conditions as they originally existed in the reservoir under pressure P_o where $N\beta_o$ is the reservoir volume occupied by all of the original residual oil containing its complement of dissolved gas and $mN\beta_o$ is the reservoir volume occupied by gas under pressure P_o. After n units of oil have been produced, the conditions have become those represented in Figure 1b where:

W-w: Net reservoir volume invaded by water.

$(N-n)\beta$: Reservoir volume of remaining residual oil including its complement of dissolved gas under pressure p.

$m N\beta \frac{\alpha}{\alpha_o}$: New volume of the gas cap obtained by expansion of the gas between pressure P_o and p and assuming that no free gas was produced from the gas cap as it should be if modern accepted production practices were adhered to.

Now, considering a material balance on gas and that the net space vacated by oil and gas produced must be filled exactly by gas that came out of solution in excess of the gas produced, we have:

The net vacated space is equal to the reservoir space vacated by the oil produced ($n\beta_o$) plus the volumetric shrinkage of the oil remaining (N—n) (β_o—β) minus the expansion of the gas cap $mN\beta_o\left(\frac{\alpha}{\alpha_o}-1\right)$ and minus the net water encroachment (W—w). Expressed in mathematical terms this reads:

(1) Net vacated space $= n\beta_o + (N-n)(\beta_o-\beta) - mN\beta_o\left(\frac{\alpha}{\alpha_o}-1\right) - (W-w)$

The volume of gas at standard conditions that came out of solution in excess of the net gas produced is equal to the sum of the gas in solution in the n units of oil produced (nS_o) and of the gas that came out of solution from the oil remaining in the reservoir, (N—n) (S_o—S), minus the net gas produced ($n r_s$), or when expressed in mathematical form:

(2) Volume of excess liberated gas $= nS_o + (N-n)(S_o-S) - nr_s$ at standard conditions.

The volume of gas as given by (2) when reduced by the volumetric factor α must be equal to the net vacated space as given by (1) if no gas is to remain unaccounted for, giving:

(3) $n\beta_o + (N-n)(\beta_o-\beta) - mN\beta_o\left(\frac{\alpha}{\alpha_o}-1\right) - (W-w) = \alpha[nS_o + (N-n)(S_o-S) - nr_s]$ which when simplified and solved for N, yields

(4) $$N = \frac{n[\beta + \alpha(r_s-S)] - (W-w)}{m\beta_o\left(\frac{\alpha}{\alpha_o}-1\right) + \alpha(S_o-S) - (\beta_o-\beta)}$$

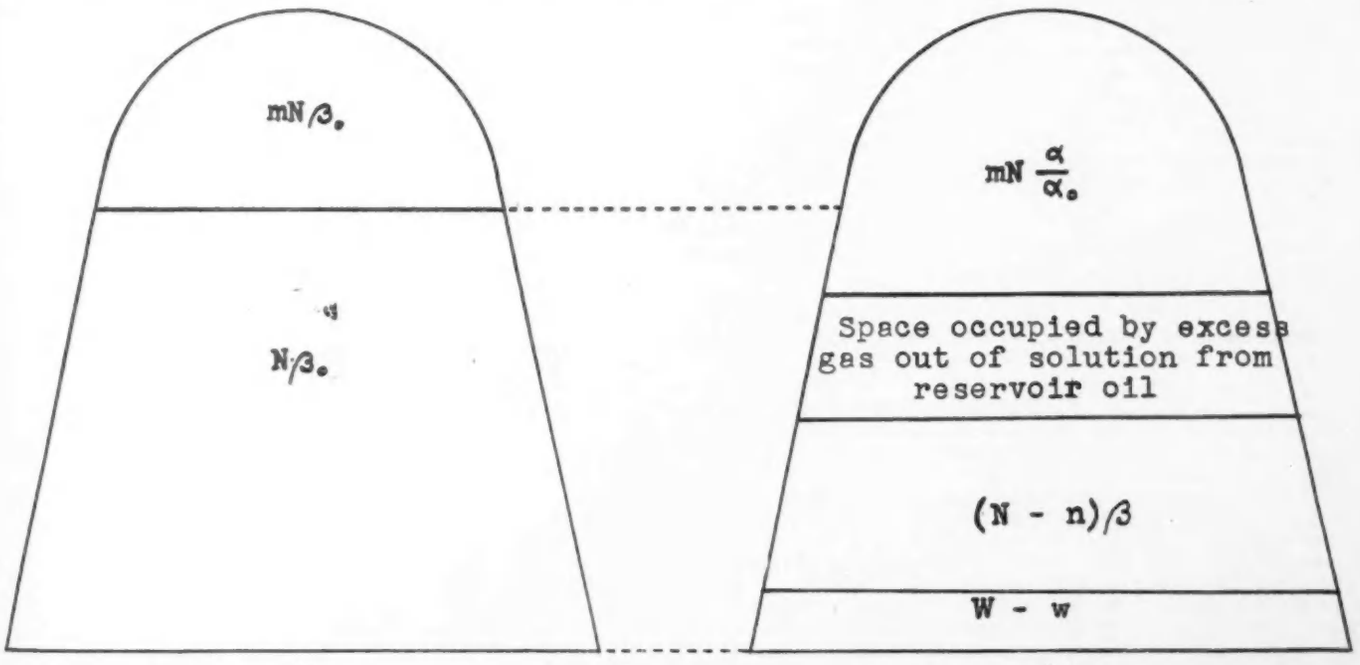
which is exactly Schilthuis' equation though on a somewhat different form. This can be verified by introducing in equation (4) the expression $\mu = \beta + \alpha S$—S) and $\mu_o = \beta_o$.

Katz's Material Balance Method

In his derivation Katz makes the assumptions that water drive is absent from the field and that there is no gas cap. However, it will be shown that both of these assumptions need not necessarily be made and that terms taking into account water drive and gas-cap expansion can be introduced in Katz's computations, thereby yielding results as general as those found by the Schilthuis formula. It is of course necessary to assume that good production practice will be adhered to and that no gas will be produced from the gas cap.

Knowledge of reservoir fluid characteristics must be obtained as for Schilthuis' method: i.e., deviation factor for gas compressibility, gas solubility and oil shrinkage characteristics, bottom hole pressures and temperature, etc.

For the sake of uniformity and easy comparison, the notations chosen above will be used. The first two columns of Katz's procedure are reproduced in Table 1 using the same order number and explanation. The third column gives



1a
Initial conditions at initial bottom hole pressure P_o

1b
Initial conditions at bottom hole pressure p

FIGURE 1
Idealized representation of reservoir conditions

the symbolic representation or formula as the case may be for the particular step and using the above notations. Steps from 1 to 11 inclusive are straightforward and show no departure from Katz's original method. Step 12 shows the first departure as the void space created by the oil and gas produced (which is the sum of steps 10 and 11) is partly filled by water encroachment (W—w) and by the gas cap expansion taking place between pressures P_o and p and given by $mN\beta_o\left(\frac{\alpha}{\alpha_o}-1\right)$. The accounting of water encroachment and gas cap expansion is carried throughout the remaining calculations.

Step 16 gives the total number of units of residual crude initially present in the reservoir which is also the quantity calculated by the Schilthuis equation. The value of N, according to the present derivation in step 16, may be written:

$$(5):\ N = n\left[1+\frac{r_o-S_o}{S_o-S}+\frac{\beta_o}{\alpha(S_o-S)-(\beta_o-\beta)}+\frac{(r_o-S_0)\quad(\beta_o-\beta)}{(S_o-S)\ [\alpha(S_o-S)-(\beta_o-\beta)]}\right]-\frac{(W-w)+mN\beta_o\left(\frac{\alpha}{\alpha_o}-1\right)}{\alpha(S_o-S)-(\beta_o-\beta)}$$

Equation (5) is composed of two terms: the term in n which is step 16 of the original Katz method (no water encroachment and no original gas cap) and the term in (W—w) and m which takes care of the water invasion and the fractional value of the initial gas cap on the basis of the space originally occupied by oil.

Elementary algebra used in simplifying equation (5) will show that it reduces exactly to equation (4) and the initial thesis is therefore demonstrated that there is no difference between the Schilthuis and Katz methods of evaluating the reserves of oil initially present in an oil reservoir. The appparent discrepancies which may result from applying the two methods to a given problem result from the greater complexity and the larger number of calculations necessary in using the Katz procedure by means of table forms, therefore, affording greater chances to make cumulative errors in the calculations. When the table calculations are reduced to a formula in its simplest form, the Schilthuis equation is obtained which requires only a comparatively small number of computations affording, therefore, less chances for errors.

There is no advantage to use the Katz procedure and discussion of material balance methods will be confined to the Schilthuis equation.

Discussion of Material Balance Methods Of Estimating Reserves

1. Material balance methods of estimating reserves are derived from a consideration of the reservoir as a whole. However, they can be applied to limited portions of a field, such as a lease or block of leases, under special restrictions: there must not be any movement of fluids across property lines and the field as a whole must be under internal gas drive. Active water drive, in the field as a whole, will usually lead to errors when applying material balance to a limited lease.

2. The methods of estimating reserves here reviewed are based on the assumption that the oil and gas fluids perform in the field in a manner similar to the laboratory performance of the bottom-hole samples. However, there is considerable doubt that this is the case under certain sand or reservoir-rock conditions particularly when the permeability is small. It is probable, under these conditions, that during vaporization under pressure reduction more gas remains in solution in the oil when in the rock formation than for the same oil under the same pressure in the bottom-hole sampler. This may be termed "vaporization hysteresis." It is believed that under certain conditions equivalent reservoir rock vaporization is only obtained when the pressure has dropped several hundred pounds below the pressure at which the same vaporization was obtained in the laboratory.

3. The practice of "stage separation" of crude oil from the gas has an important bearing on the calculation of reserves. Stage separation is practiced for the purpose of keeping more gas in solution in the residual oil. Therefore, the lease gas does not have the same properties as that on which the solubility-shrinkage tests were performed in the laboratory.

4. When gas first starts to come out of solution in the reservoir it is composed mostly of the more volatile hydrocarbons: i.e., methane and ethane; hence, deviation factors which should be used in the reserve computation do not only vary with pressure but also with the age of the field.

5. Should the field be the object of repressuring or recycling by injection of gas into the gas cap and should, thereby, the field pressure be increased over the pressure existing at the start of repressuring operations, it is normal to expect that the injected gas does not go immediately (if ever) in solution in the remaining reservoir oil due to the absence of sufficient mixing of the oil and gas phases. It is therefore normal to use gas deviation factors for gas-cap gas corresponding to actual gas-cap pressures whereas the shrinkage and solubility factors for oil should be those corresponding to the pressure existing at the start of the repressuring program.

6. If in a field the water-drive is sufficiently active or the rates of oil withdrawal are so adjusted that the bottom-hole pressure does not change ($p = P_o$) at all times during the producing life of the field, the following relations are verified:

$$\begin{aligned} r_o &= S_o = S \\ n\beta_o &= W - w \\ \beta &= \beta_o \\ \alpha &= \alpha_o \\ p &= P_o \end{aligned} \qquad (6)$$

A substitution of relations (6) into Schilthuis' equation (4) discloses that both the numerator and denominator vanish, accordingly, the estimation of reserve becomes undetermined and independent means must be used in order to determine the oil in place such as through application of volumetric methods which are based on the estimate of the available void space.

Rates of oil withdrawal are seldom adjusted so that no pressure drop will take place but it is important to realize that the more active the water-drive is the closer to vanishing small quantities will be the numerator and denominator of Schilthuis' equation. Consequently, any slight error made in reading pressures, shrinkage, solubility, etc., will have a disproportionate effect on the final results of reserve calculations.

7. Observation of Figure 3 reveals that the solubility and reservoir volume curves are straight lines in the high-pressure region, which region has considerable importance since it is in the early life of the field when its performance is most significant. Accordingly, in this region, the solubility and reservoir volume curves may be represented by the following expressions:

$$\begin{aligned} S &= S_i + ap \\ \beta &= \beta_i + bp \end{aligned} \qquad (7)$$

where S_i and β_i respectively represent the intersections of the straight portions of the curves with S and β ordinates, a and b are the slope of the straight lines which can best be calculated by least square adjustment.

As a first approximation it will also be considered that the supercompressibility factor Z for the evolved gas is also a constant in the region under study. Accordingly, α and α_o may be replaced by:

$$\begin{aligned} \alpha &= \frac{\gamma}{p} \\ \alpha_o &= \frac{\gamma_o}{P_o} \end{aligned} \qquad (8)$$

in Schilthuis' equation and after substitution of (7) and (8), equation (4) becomes:

$$N = \frac{n\left[\beta_i + bp + \frac{\gamma}{p}(r_o-S)\right]-(W-w)}{m\beta_o\left(\frac{P_o}{p}\cdot\frac{\gamma}{\gamma_o}-1\right)+a\frac{\gamma}{p}(P_o-p)-b(P_o-p)}$$

or, after simplification:

$$N = \frac{n[\beta_i p + bp^2 + \gamma(r_o-S)]-p(W-w)}{m\beta_o\left(P_o\frac{\gamma}{\gamma_o}-p\right)+(P_o-p)\ (a\gamma-bp)} \qquad (9)$$

Differentiating equation (9) totally, considering p, n and (W—w) as the vari-

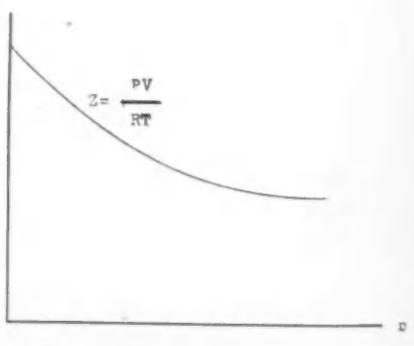
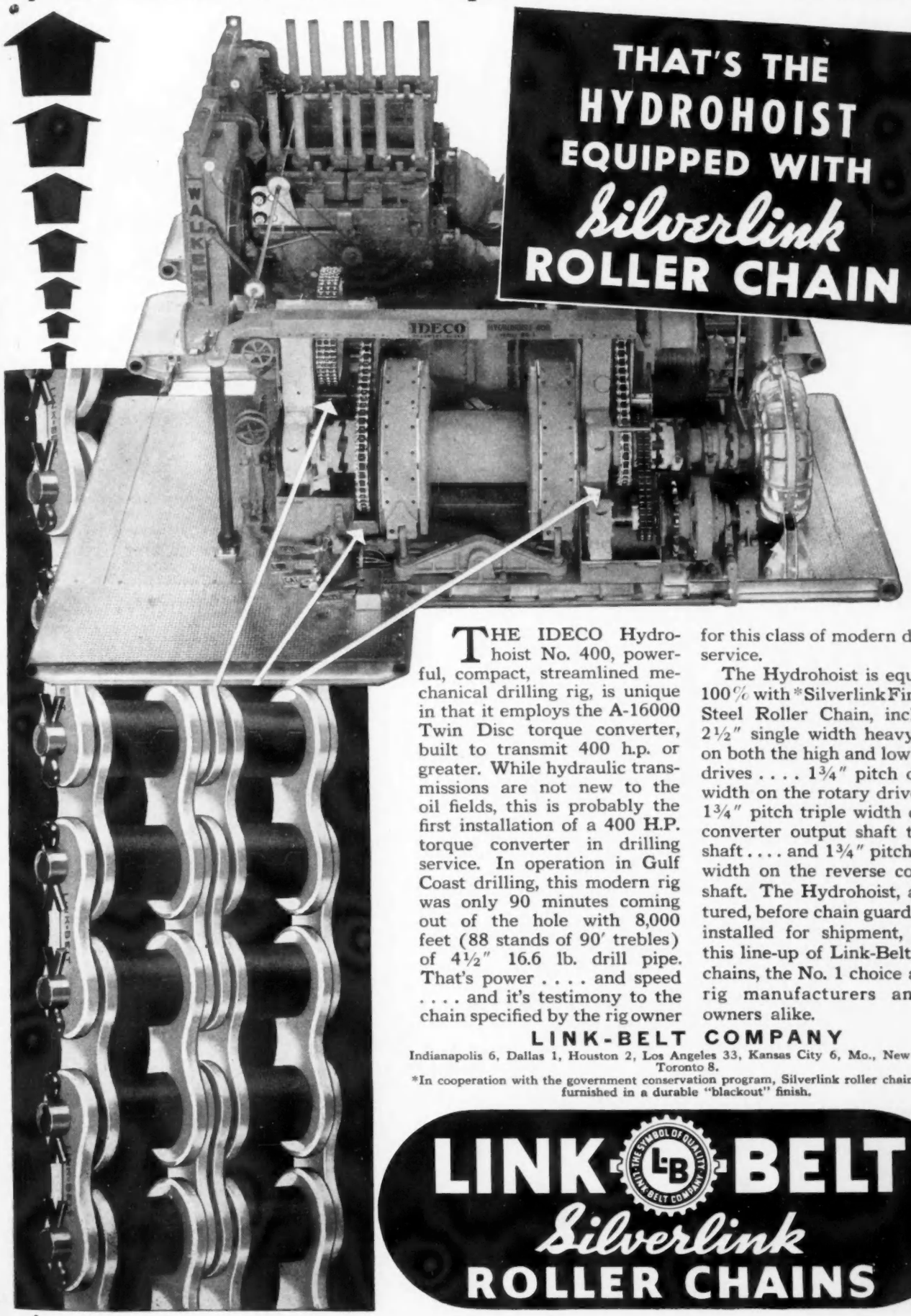


FIGURE 2

Idealized deviation factor for reservoir gas

8,000 Ft. of 4½" Pipe out in 90 Minutes



THE IDECO Hydrohoist No. 400, powerful, compact, streamlined mechanical drilling rig, is unique in that it employs the A-16000 Twin Disc torque converter, built to transmit 400 h.p. or greater. While hydraulic transmissions are not new to the oil fields, this is probably the first installation of a 400 H.P. torque converter in drilling service. In operation in Gulf Coast drilling, this modern rig was only 90 minutes coming out of the hole with 8,000 feet (88 stands of 90′ trebles) of 4½" 16.6 lb. drill pipe. That's power . . . . and speed . . . . and it's testimony to the chain specified by the rig owner for this class of modern drilling service.

The Hydrohoist is equipped 100% with *Silverlink Finished Steel Roller Chain, including 2½" single width heavy duty on both the high and low speed drives . . . . 1¾" pitch double width on the rotary drive . . . . 1¾" pitch triple width on the converter output shaft to line shaft . . . . and 1¾" pitch triple width on the reverse countershaft. The Hydrohoist, as pictured, before chain guards were installed for shipment, shows this line-up of Link-Belt roller chains, the No. 1 choice among rig manufacturers and rig owners alike.

LINK-BELT COMPANY

Indianapolis 6, Dallas 1, Houston 2, Los Angeles 33, Kansas City 6, Mo., New York 7, Toronto 8.

*In cooperation with the government conservation program, Silverlink roller chain is now furnished in a durable "blackout" finish.

9379

LINK-BELT
Silverlink
ROLLER CHAINS

ables and expressing the ratio $\left(-\frac{dn}{dp}\right)$ which can be termed the "**overall productivity index**" of the field, we obtain

$$-\frac{dn}{dp}=\frac{N[m\beta_o+b(P_o-p)+(a\gamma-bp)]+n(\beta_1+2bp-a\gamma)-(W-w)}{\beta_1 p+bp^2+\gamma(r_s-S)}+\frac{p}{\beta_1 p+bp^2+\gamma(r_s-S)}\cdot\frac{d(W-w)}{dp} \quad (10)$$

In a water-drive field, the application of equation (10) necessitates the knowledge of the total net water encroachment (W—w) to the time at which the field pressure has fallen to p and of the pressure rate of net water encroachment $\frac{d(W-w)}{dp}$. These are usually known provided enough data have been kept on the performance of the field. Equation (10), therefore, permits the predetermination and forecast of future overall productivity indices as a function of pressure.

In the simplified case of a field under internal gas drive only, where water neither encroaches nor is produced (W = o and w = o), formula (10) reduces to the simpler expression:

$$-\frac{dn}{dp}=\frac{N[m\beta_o+b(P_o-p)+(a\gamma-bp)]+n(\beta_1+2bp-a\gamma)}{\beta_1 p+bp^2+\gamma(r_s-S)} \quad (11)$$

If, furthermore, the original gas cap volume is absent formula (11) reduces to (12)

$$-\frac{dn}{dp}=\frac{N[b(P_o-p)+(a\gamma-bp)]+n(\beta_1+2bp-a\gamma)}{\beta_1 p+bp^2+\gamma(r_s-S)} \quad (12)$$

The only controllable factor which appears in equation (11) is r_s; it can be larger than the solution gas (S) or equal to it; or through repressuring it can be made smaller than the solution gas. Therefore, equation (11) permits the forecast of future overall productivity indices when the field has dropped to a given pressure (p) through the production of (n) units of oil out of an initial reserve (N).

It should be noted that the above overall productivity index formulae disregard the permeability characteristics of the reservoir which is considered as being 100 percent porous.

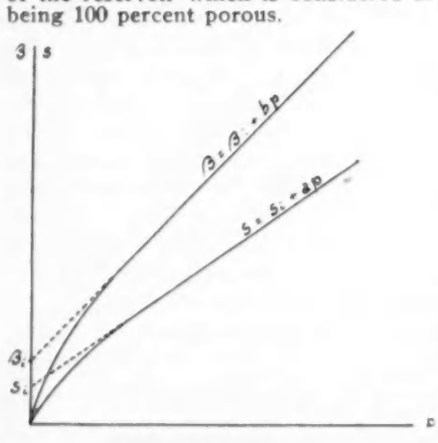


FIGURE 3
Idealized solubility and reservoir volume factor for reservoir fluid.

Examples of Application

Example I: In a producing field, the following quantities and relationships have been established by means of bottom hole pressure testing and bottom hole samples testing:

$P_o = 3500$ psi absolute
$p = 1500$ psi absolute
$n = 25{,}000{,}000$ bbls of residual oil
$r_s = 1200$ cu. ft. gas per bbl of oil
$Z = .9$
$T_b = 200°$ F
$m = .01$
$w = 100{,}000$ bbls of water
$S = 20 + .035\ p$ in cu. ft. gas per cu. ft. oil
$\beta = 1.2 + .00008\ p$

It has also been established by other considerations that the rate of water encroachment is 100 barrels per month per pound pressure drop. At the time that the field pressure had dropped to $p = 1500$ psi the field was 60 months old.

Calculate: 1. The initial residual oil content of the reservoir.

2. The overall field productivity index.

Solution: The following quantities are calculated:

$$-\frac{dn}{dp}=N\frac{b(P_o-p)+(a\gamma-bp)+\frac{a\alpha-b}{\beta+\alpha(r_s-S)}(P_o-p)\ (\beta_1+2bp-a\gamma)}{\beta_1 p+bp^2+\gamma(r_s-S)}$$

$\beta_o = 1.2 + .00008 \times 3500 = 1.48$ $\quad a = .035$
$\beta = 1.2 + .00008 \times 1500 = 1.32$ $\quad b = .00008$
$S_o = 20 + .035 \times 3400 = 142.5$ $\quad \gamma_o = 16.8$
$S = 20 + .035 \times 1500 = 72.5$ $\quad \gamma = 16.8$

$$\alpha_o = \frac{14.7}{3500}\cdot\frac{660}{520}\times .9 = .0048$$

$$\alpha = \frac{14.7}{1500}\cdot\frac{660}{520}\times .9 = .0112$$

By substitution, the value of the initial reserves is obtained:

$$N=\frac{25{,}000{,}000\ [1.32+.0112(214-72.5]-11{,}900{,}000}{.01\times 1.48\left(\frac{.0112}{.0048}-1\right)+70\times .0112-.16}$$

$= 94{,}500{,}000$ bbls residual oil.

In order to find the overall field productivity index at the time when $p = 1500$ psi absolute it is necessary to consider an interval of time over which the calculation will be made so that the water encroachment may be computed. Let us assume that the calculation will extend over a 12 month period; thus the term $\frac{d(W-w)}{dp} = 12 \times 100 = 1200$ bbls of water per pound pressure drop. Substituting in equation (10) we obtain:

$$-\frac{dn}{dp}=\frac{94.5\times 10^6[.01\times 1.48+.00008(3500-1500)+(.035\times 16.8-.00008\times 1500)]+25\times 10^6(1.2+.24-.56)-11.9\times 10^6}{1.2\times 1500+.00008(1500)^2+16.8(141.5)}$$

$$+\frac{1500}{1.2\times 1500+.00008(1500)^2+16.8(141.5)}\times 1200$$

or: $-\frac{dn}{dp} = 16{,}500$ bbls/psi/year.

This figure may seem small but one must remember that it applies to a reservoir with 100 percent porosity. In an actual oil field, the presence of pore space and capillary channels greatly increases expulsive efficiency of the gas.

Example II: In an internal-gas-drive field, the following quantities and relationships have been established:

$P_o = 2000$ psi absolute
$N = 4{,}000{,}000$ bbls of residual oil
$S = (20 + .04\ p)$ cu. ft. gas per cu. ft. oil.
$\beta = 1.15 + .0001\ p$
$T_b = 150°$ F
$Z = .9$

There is no gas cap, no water encroachment, nor water produced.

Calculate the overall field productivity index assuming:

1. Net gas-oil-ratio is at all times equal to the solution gas.
2. Net gas-oil-ratio is at all times equal to ½ the solution gas.
3. Net gas-oil-ratio is at all times equal to twice the solution gas.

Solution: In this case Schilthuis' equation reduces to the simpler form

$$N=\frac{n[\beta+\alpha(r_s-S)]}{(S_o-S)\ \alpha-(\beta_o-\beta)}$$

and, substituting the values of β_o, β, S_o and S as a function of pressure in the high pressure region; we obtain

$$N=\frac{n[\beta+\alpha(r_s-S)]}{(P_o-p)\ (\alpha a-b)}$$

Introducing the value of n as derived from this last relation into equation (12), we obtain:

Letting successively p equal 2000, 1500, 1000 and 500 psi absolute for r_s equal ½S, S and 2S we obtain the results.

Overall Field Productivity Index

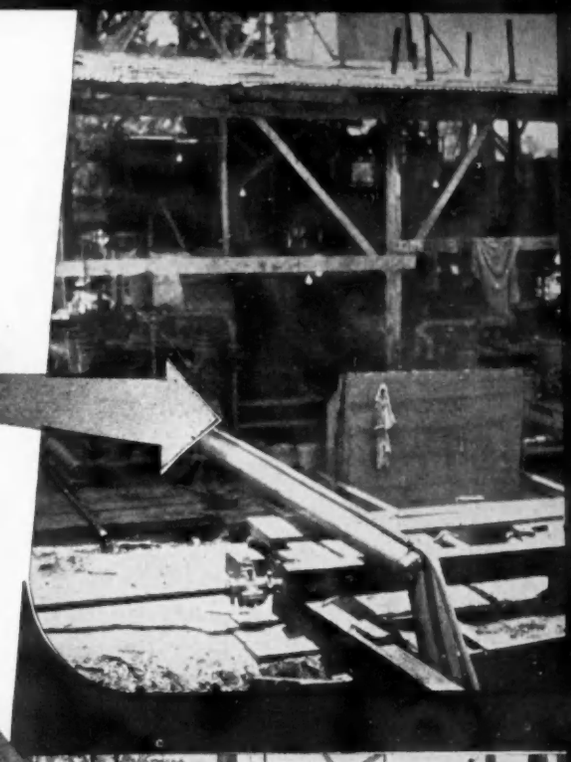
Inasmuch as relation (9) does not hold for low pressures (generally pressures lower than 25 percent of the

TABLE 2

Reservoir Pressure psi. abs.	NET GAS-OIL-RATIO : r_s		
	$r_s = ½S$	$r_s = S$	$r_s = 2S$
2000	875 bbls./psi.	622 bbls./psi.	395 bbls./psi.
1500	2,005 bbls./psi.	1,300 bbls./psi.	740 bbls./psi.
1000	5,630 bbls./psi.	3,230 bbls./psi.	1,800 bbls./psi.
500	35,600 bbls./psi.	15,120 bbls./psi.	4,870 bbls./psi.

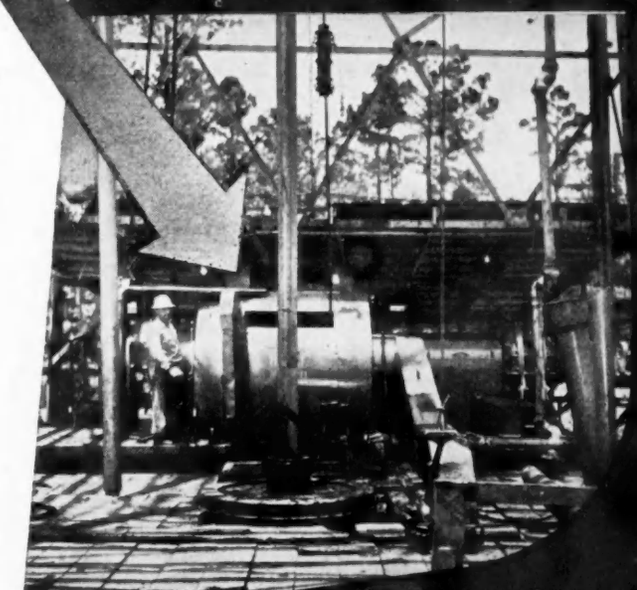
Every Angle

you'll find National Oil Field Equipment best suited to your needs!



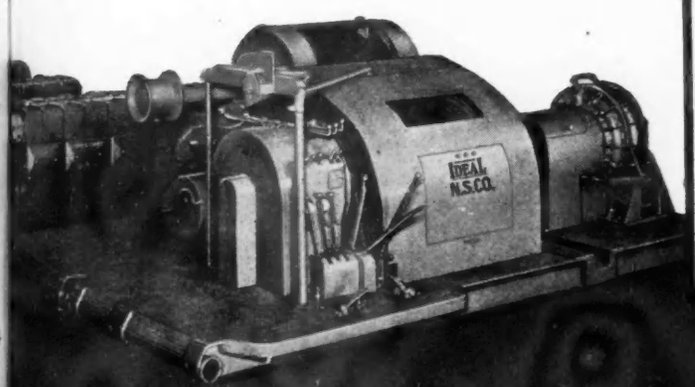
CONSIDER National Oil Field Equipment from any standard you set . . . high first value, exceptional performance ability, long service, and prestige of the maker . . . and you'll find The National Supply Company the best source for your oil field machinery and equipment.

The wide range of National Supply Company products may be considered to be made "All Under One Roof" . . . under one management . . . and under the same qualified, experienced supervision. The same high-standard manufacturing policies apply to all The National Supply Company plants. And from the many conveniently-placed National Supply Company stores you get the same "All Under One Roof" completeness of service.



Wherever you are, and whatever your oil field requirements may be, there are National Supply stores ready and willing to help you with equipment and service.

Buy "National Supply"... from the power plant right through all essential pipe, machinery and equipment.



The National Supply Company

Executive Offices: Pittsburgh, Pa.

General Sales Offices: Toledo, Ohio. Division Offices: Denver; Ft. Worth; Pittsburgh; Tulsa; Torrance. Export: The National Supply Corporation, 30 Rockefeller Plaza, New York, N. Y., U. S. A.; River Plate House, 12 South Place, London, E. C. 2.

original bottom-hole pressure), a calculation of the field's overall productivity index for pressures lower than 500 psi. would lose all significance. Table 2 shows, as was expected, a rapid increase in the field's productivity index as the field pressure decreases and more particularly when gas-oil-ratios are restricted or gas reinjected into the field. The inverse of $-\frac{dn}{dp}$ or $-\frac{dp}{dn}$ which is the slope of the curve obtained when plotting field pressure versus cumulative production can also be computed from formula (10), or the simplified formulae (11) and (12) and, therefore, the future pressure decline curve can be forcast according to various gas-oil-ratio conditions.

Conclusions

The equivalence of the material balances of Schilthuis and Katz for calculating the original oil in place has been demonstrated and the balance equation has been discussed particularly with respect to its precision where an active water-drive is present and concerning the production of field overall productivity indices. Possible causes of errors have been pointed out.

Unfortunate Feature

One unfortunate feature of the Schilthuis material balance equation is the presence of the water encroachment term in the numerator; considerable thought and work have been expended without success by the writer and his associates in trying to eliminate this term from the equation by the simultaneous solution of various material balance equations obtained on various bases. The Schilthuis equation is essentially a gas material balance. It was thought that material balance yielding different equations could be found by writing a material balance on oil, or by writing a volumetric balance, or by establishing a density balance of the fluids, etc. When any of the above are successful, they always yield a formula equivalent to Schilthuis' equation or resolve themselves into an identity equation from which all terms cancel out.

Acknowledgements

The writer wishes to acknowledge the helpful criticisms and discussions of the views here presented by his colleagues and thanks are particularly due to Jack Tarner who supplied some of the ideas used in the discussion. Thanks are also due to the Penn State Senior class in Petroleum Engineering on whom this presentation was first tried out and who have contributed by their questions to the clarity of the exposé.

REFERENCES

[1]Ralph J. Schilthuis—Active Oil and Reservoir Energy—Trans. AIME (Petrol. Devel. and Techn.)—Vol. 118—pp. 33-52, 1936.

[2]D. L. Katz—A Method of Estimating Oil and Gas Reserves—Trans. AIME (Petrol. Devel. and Techn.)—Vol. 118—pp. 10-32, 1936.

Reserves and Prices

■ CONTINUED FROM PAGE 27

provide for its military, industrial, and civilian requirements.

The below-parity price is held largely responsible for the downward trend in the discovery of new reserves by many oil companies, and opinion within the industry has largely crystallized to that conclusion. In The Texas Company report, it is stated that "It is believed that a more equitable price is necessary to stimulate exploratory drilling particularly on the part of the small producer. The number and depth of these exploratory wells must be increased beyond that considered normal in the past. At present price levels the independent producer, in most cases, cannot afford to incur the risks inherent in wildcat drilling."

Sun Oil Company protests the low price on the grounds that oil exploration has been discouraged at a time when new discoveries are badly needed to meet the war demand. The Bureau of Labor Statistics index figure for all wholesale commodity prices is now at 103 percent of the 1926 base, the report points out. The index figure for wholesale raw material prices is at 112.3 percent of that base, but the index figure for petroleum products is only 63.3 percent of the base figure. In the last seven years the index figure for wholesale raw material prices has advanced from 84.8 to 112.1 but the average price of crude per barrel has advanced from $1.18 in 1937 to $1.25 for 1943. Labor costs since the war started have advanced approximately 30 percent. Thus it is clear the petroleum industry is being forced to meet increased labor and material costs at a price level for its products that has remained substantially stationary.

"To bring crude oil to a parity with other commodities would raise its price over 75 cents per barrel. The Petroleum Administrator for War recognizing this gross inequity, appealed to the Office of Price Administration for an immediate increase of 35 cents per barrel. The refusal of the Office of Price Administration even partially to adjust this discrmination against petroleum, constitutes a total disregard of the fundamentals of justice and fair play toward an industry that is vital to the war effort."

Phillips Petroleum Company sees present prices reflected in the declining rate of discovery of new pools. "At present prices for crude oil, much of the industry's previously acquired underground raw materials are moving into markets for less than their present high replacement and producing costs. Obviously necessary exploration efforts cannot be sustained indefinitely, and important reserves under unprofitable or low-profit properties cannot be saved from abandonment unless an adequate price for crude oil is obtained."

Assailing the "specious" argument advanced by OPA and the Office of Economic Stabilization, that because some oil companies are showing good profits in their annual statements, they are being fairly recompensed for their production operations, The Pure Oil Company counters with a flat denial. "The financial statements of the oil producer do not reflect the fact that the oil he is selling today has been paid for largely by previous exploratory and development operations, and that much of the apparent profit that is shown is in fact a reflection of previous years' operations, and that this oil, drawn from developed reserves, can not now be replaced at the former costs.

"Contrary to normal procedure, during this war period, prices of crude oil have been set by the government which has not recognized the fact that costs have increased and that, as a whole, the industry is being forced to spend more money in producing crude petroleum than it gets back in the way of price."

"American Economic Development"

The Pure Oil Company's comment likens the petroleum company today to a "merchant who is selling an inventory bought at a low price level, but which he cannot replace except at a ruinously advanced cost. This does not apply to every individual producer or corporation because some, due to unusual circumstances, whether exceptional efficiency or sheer good luck, will, from time to time, make discoveries that prove very profitable. Obviously, an adequate permanent supply of crude oil cannot be secured in any other way than through compensatory prices unless the traditional philosophy of American economic development is a false one."

The Atlantic Refining Company backs up The Pure Oil Company's stand with the declaration to its stockholders that "While it was clearly evident that the earnings of 1942 were adversely affected by impacts of the war, in no real sense could it be said that the 1943 earnings were favorably affected by the war."

Touching on prices, the report cites that the 1943 prices of the industry's products and most of its crude oils moved almost horizontally across the 12 months of the year at the levels established by the government's price-control agency for the preceding year. Moreover, relatively, petroleum prices have not been high prices. The average price of crude oil at the well was less than 1 percent higher than it was in 1937; and the price of a barrel of petroleum products at wholesale was less than 2 percent higher. For comparison, the index of wholesale prices for all commodities, according to the Federal Bureau of Labor Statistics, was more than 19 percent higher than for 1937.

"Consequently the great volumetric contribution of the petroleum industry to the war effort did not give rise to multi-billion dollar charges for petroleum to the government. In fact, despite the big role of petroleum in waging war, it would appear that during 1943 its cost to the government was less than 2 percent of our country's total war expenditures."

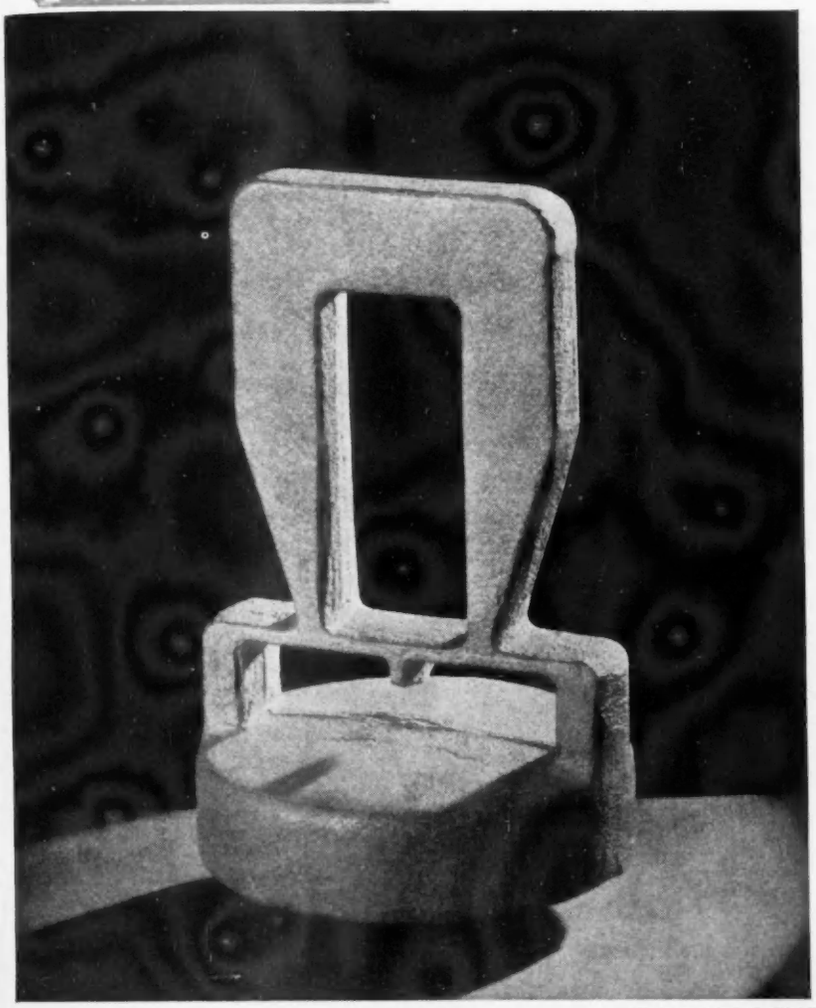
Several other smaller concerns noted that mainly because of increased costs, it was necessary to curtail development operations during the year.

Just how long the oil industry can operate contrary to the law of economic gravity is a question hard to answer. Most companies feel it their duty to do everything possible to aid in the war effort, regardless of cost to their organizations. Nevertheless, they continue to hope for more consideration from the government they are helping support.

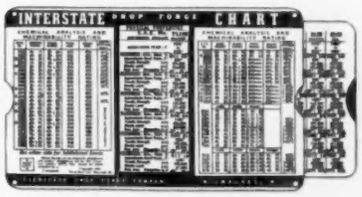
INTERSTATE FORGINGS FOR ENDURING QUALITY

MANUFACTURERS of oil well machinery know that only quality materials can be used for this demanding service. Frequent shutdowns for repairs mean tremendous losses in time and production.

That's why *drop forgings* are always specified for the hardest working parts.



We at INTERSTATE have for years specialized in meeting the tough service requirements of the oil industry. We are proud to number many of the leading manufacturers of oil well equipment among the hundreds we are serving in more than 30 industries. Our plant has the most modern and complete equipment and our staff of engineers and metallurgists is available to work out complicated forging problems.



INTERSTATE SLIDE-RULE CHART FOR STEEL

Gives recommended heat treatment, physical properties and machinability ratings at a glance. A request on your business letterhead will bring you one with our compliments.

Back the Attack! *Buy* **MORE** *War Bonds!*

INTERSTATE
DROP FORGE COMPANY

DROP OR UPSET FORGINGS
CARBON OR ALLOY STEELS
HEAT TREATING
METALLURGICAL CONTROL
MAGNETIC INSPECTION EQUIPMENT

DIF

4024 NORTH 27TH STREET
MILWAUKEE, WIS.

Petroleum Possibilities in Szechuan Province, China

Bordering the highlands of Tibet, Szechuan with its famous Red Basin would undoubtedly be widely explored before now if more accessible; deeply buried paleozoic formations seem most attractive possibility

By J. MARVIN WELLER, Geologist

SZECHUAN province in central western China bordering the highlands of Tibet is one of the largest and most populous subdivisions of that country. Since the fall of Hankow in 1938 it has assumed great national importance and the capitol is now situated at Chungking 1000 miles up the Yangste River from the sea. Szechuan has long been noted for its extensive coal deposits and its important salt industries but like most other parts of China it is dominantly an agricultural area. With the advance of Japanese conquests, however, many industrial establishments were dismantled and transported to this far interior region and the government's efforts to expand its industries have apparently met with considerable success. After the war this province will certainly have been transformed into one of the most economically important parts of China and successful development of its possible oil resources would be of great significance. Reports that exploration is now in progress are, therefore, of considerable interest.

The Red Basin, more than 60,000 square miles in extent, constitutes nearly one-half of the total area of Szechuan. This region is a basin in the sense that it is a comparatively lower region of younger rocks completely surrounded by more or less lofty mountains formed by the upthrusting of older and more resistant strata. Except for the Chengtu plain in the northwestern part, which is a large alluvial fan deposited by the Min River, it is a hilly area with local relief of about 1000 feet. The topography is controlled to a considerable extent by structure and the gently dipping beds have resulted in development of innumerable subdued terraces and mesas while steeper dipping strata have produced pronounced hog-back ridges. Many of the rivers flow in steeply intrenched valleys and only the more important ones have cut below an elevation of 1000 feet.

Conspicuous Red Beds

Little detailed geologic work has been done in Szechuan, but the general features of the stratigraphic succession have been made known from the investigations of the Chinese Geological Survey. This organization classifies the formations encountered in the salt wells and in outcrops near Omei Shan as shown in the accompanying columnar section (Figure 1). In some parts of the basin as much as 3000 feet of Tertiary strata overlie the Cretaceous and the thick apparently non-marine post-Triassic section is noteworthy. These are the strata that outcrop throughout the basin and their conspicuous red beds have furnished it with its very appropriate name.

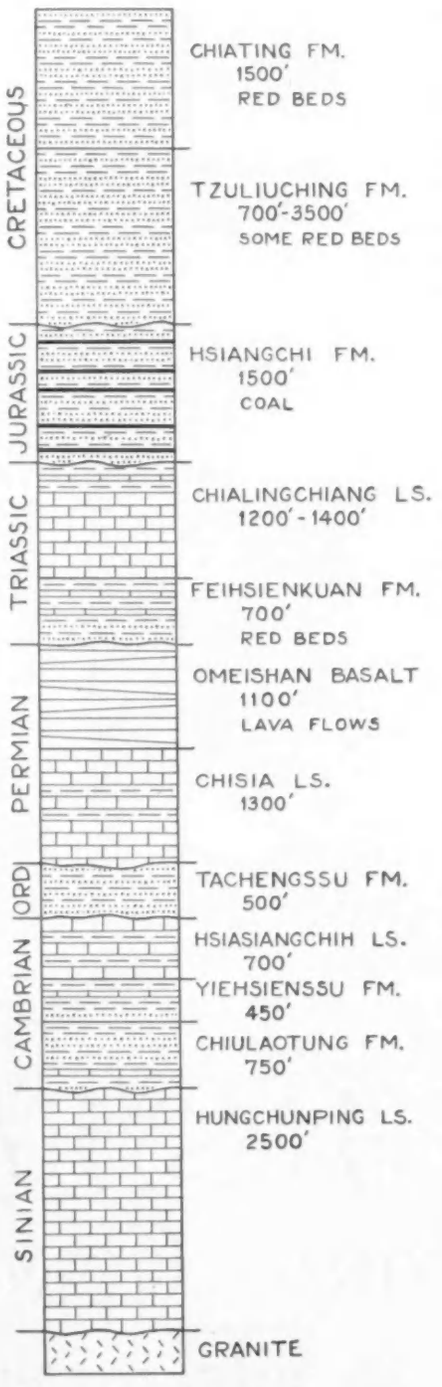


FIGURE 1
Formations encountered in Chinese salt wells

The most important unconformity occurs at the base of the Permian system but little is known regarding its details. In mountains north of the basin a thick section consisting of more than 15,000 feet of strata assigned to the Devonian (mainly quartzite below grading up into massive limestone) and about 1500 feet of Silurian (greenish shale with nodular limestones) separates the Ordovician and Permian, and Carboniferous strata (limestones, sandstones and shales) are reported to be present in the southeastern part of the province.

The Permian section varies considerably about borders of the basin. The Omei Shan basalt, shown in Figure 1, is present only to the southwest. To the north another formation consisting of thinbedded limestone and shale overlies the Chisia limestone. Coal is present in the latter formation along both northern and eastern borders of the basin and near Chungking but seems to be absent in the neighborhood of Omei Shan.

Triassic marine limestone is reported to be missing, at least locally, in northwestern Szechuan.

Nothing is known regarding the distribution of the Paleozoic formations beneath the basin although it is probable that the Permian Chisia limestone is everywhere present.

Some information concerning the subsurface stratigraphy of the Mesozoic strata has been obtained from the numerous brine wells in the western half of the basin. These wells, some of which are between 2000 and 3000 feet deep, were drilled without mechanical power and one of them may have required the investment of a family's fortune and a generation of labor for its completion. Brine is bailed from the wells and commonly passes to the evaporators through pipelines formed by a series of bamboos from which the joints have been removed.

Small amounts of oil are obtained with the brine from a few of the wells. The greatest recorded production from any single well is 3000 catties (about 10 barrels) per day but the amount yielded by most of them can be measured in quarts. Gas under low pressure issues from some of the wells and appears to be somewhat more widespread in its occurrence than the oil but little data concerning it are available. Such gas as is obtained its utilized to evaporate the brine.

Deeper Shows Better

Oil is recorded to have been obtained from various horizons in the Triassic,

★ ★ ★ HIGHWAYS TO VICTORY ★ ★ ★

PAVED WITH PIPE AND POWERED BY GASO

In this war, the highways to victory are the ingenious portable pipe lines that carry oil from central supply depots to our fighting fronts.

They helped in the conquest of Africa, made possible our rapid advance in Sicily, and are moving ever closer to Berlin and Tokyo.

Aside from fast construction, the emphasis in the design and development of these pipe lines has been on trouble-free operation — all of which makes us doubly proud that they are powered by Gaso Pumps exclusively.

The assignment has been a tough one, calling for the full use of our facilities and the continuous sacrifice of our men. Our men find satisfaction in the knowledge of a vital job well done. We hope that you may find it in the knowledge that the Gaso pumps which might normally have gone to you are helping to speed the day when normal operations are again resumed. . . Gaso Pump & Burner Mfg. Co., 902 E. First Street, Tulsa, Oklahoma. Export Office: 149 Broadway, New York. Shreveport: W. L. Somner Co., 419 Lake Street. Los Angeles: Service Oil Field Supply Co., 5333 S. Riverside Drive.

GASO PUMPS

FOR EVERY OIL INDUSTRY NEED

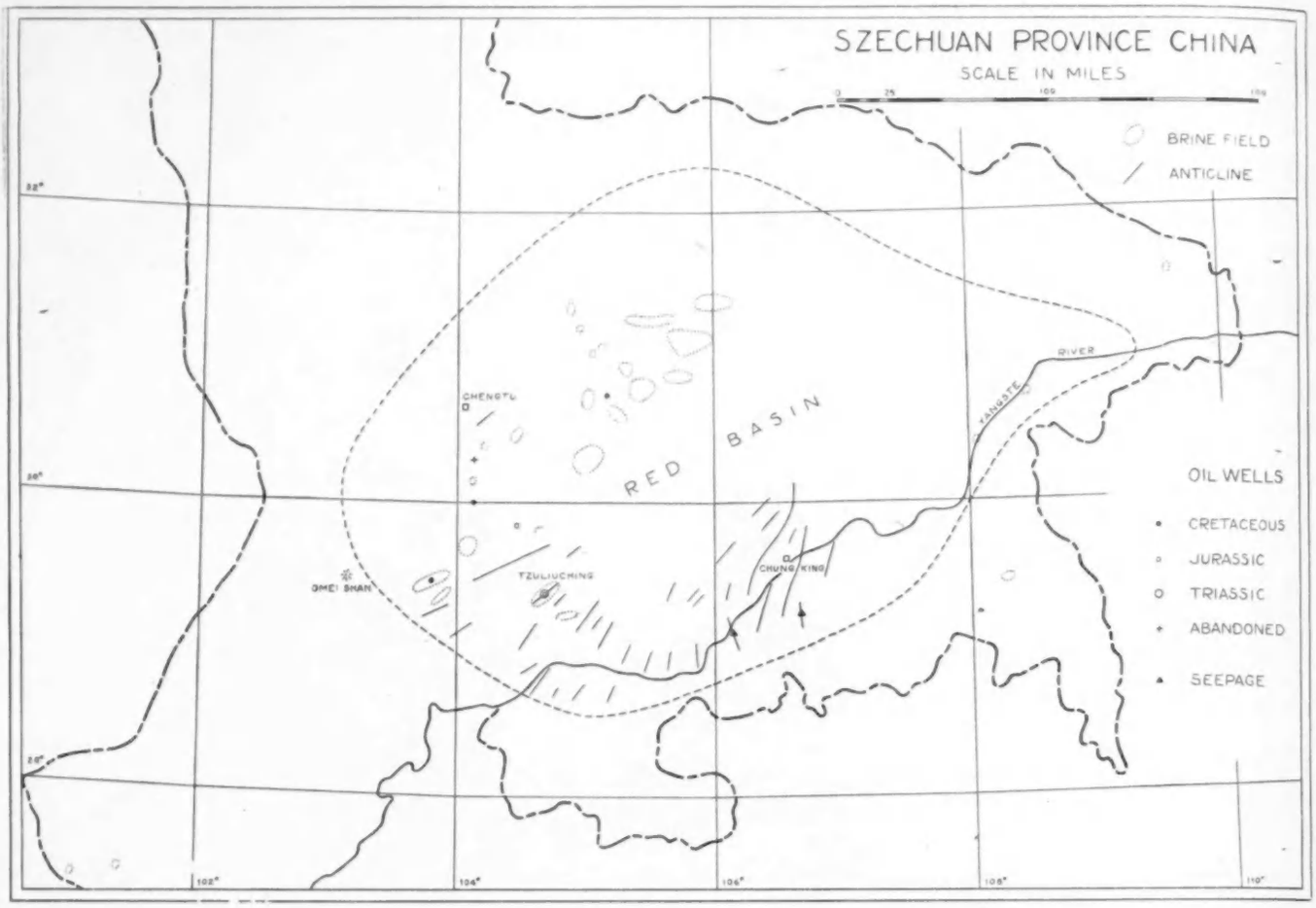


FIGURE 2
Oil wells and anticlines in Red Basin, Szechuan Province, China

Jurassic and Cretaceous. The best shows apparently were from the upper and lower parts of the Tzuliuching formation, the upper and lower parts of the Hsiangchi formation and the upper and middle parts of the Chialingchiang limestone but they are exceedingly erratic. Shows at the deeper horizons have, in a general way, been stronger than those at shallower ones.

Some of the brine fields are located on anticlines and the wells have served to test the post-Paleozoic horizons on these structures quite thoroughly for oil. Best example is the Tzuliuching anticline which has been mapped in detail by the Chinese Geological Survey. Wells there have passed completely through the Chialingchiang limestone and absence of important amounts of oil has been considered to reflect unfavorably upon the possibilities of the Szechuan basin as a whole. In other districts, however, wells have nowhere penetrated to the Triassic and in the northern part of the basin no wells have continued below the base of the Cretaceous. Finally, few wells have been drilled in the eastern half of the basin.

Several oil seepages occur in the eastern part of the Red Basin. They have never been adequately described but seem to issue on or near steeply folded anticlinal structures. The amount of oil escaping at any of these places is small. At least one well has been drilled by the Chinese government near the seepage about 25 miles southeast of Chungking, apparently without particularly favorable results.

Many anticlines are present within the basin generally trending in a northeast-southwest direction. The more important ones that have been reported are shown on the accompanying map (Figure 2). They seem to be most abundant in the southern part but their distribution along the Yangtze River suggests that geological investigations have not been continued northward where similar structural conditions might be expected to prevail. Jurassic and Triassic rocks are brought to the surface along the crests of some of these structures, rising from beneath the surrounding Cretaceous red beds. Dips upon the flanks vary from very gentle to nearly vertical and many of the folds are asymetrical. The southeastern flanks are commonly steeper but this relationship is reversed at some places. In general, compression of individual structures increases from west to east.

Origin of oil in Szechuan is far from certain. Descriptions of the post-Triassic formations, which are evidently largely non-marine, fail to suggest the presence of likely source beds and oil in these formations may have migrated upward from some deeper horizon. Brine concentrations decrease upward from 20 percent or more in the Chialingchiang limestone suggesting, but not proving, that these solutions migrated upward and became progressively more dilute. At Tzuliuching some oil occurs in the Chialingchiang limestone. Brine from the underlying Feihsienkuan formation contains only 3 to 4 percent of salt and this great discrepancy seems to be good evidence against upward migration in the migration in the Triassic beds at that place. At Tzuliuching, therefore, it is probable that some oil originated in Triassic limestone where it still remains. Possibly oil from this source could have migrated upward into the other formations in which it has been found.

Right for Exploration

General features of the Red Basin in Szechuan are such that if it were located in the United States or in some other more accessible part of the world it would undoubtedly be widely explored. Failure of the brine wells to find more than shows indicates that the Mesozoic formations are not likely to be productive although the Triassic limestone cannot be completely condemned. Most attractive possibilities of the basin appear to be offered by the more or less deeply buried Paleozoic formations which have never been penetrated by the drill and details of whose development and distribution are almost totally unknown. Probably the Permian Chisia limestone is everywhere present. This formation contains carbonaceous and possibly bituminous beds at its outcrops in the mountains surrounding the basin and is similar to limestone that is productive in some other parts of the world. In addition, marine strata of Carboniferous, Devonian, Silurian and Ordovician ages probably underlie parts of the basin and are not without possibilities.

PERFORMANCE IS THE YARDSTICK

☆ Wherever or for what purpose wire rope is used, the objective is trustworthy performance. A premature failure slows down the work, consumes more material and increases the operating cost.

To meet the unprecedented demands of today, we recommend Preformed "HERCULES" (Red-Strand) Wire Rope. Due to the advantages of the preforming process, it is easier, quicker and safer to handle . . . the normal "breaking-in" period is shortened . . . it lasts longer. These statements become verified facts when measured by the yardstick of performance.

WHAT HAVE YOU DONE TODAY FOR VICTORY?

MADE ONLY BY

A. LESCHEN & SONS ROPE CO.

WIRE ROPE MAKERS — ESTABLISHED 1857

5909 KENNERLY AVENUE — ST. LOUIS, MISSOURI, U. S. A.

NEW YORK . . . 90 West Street
CHICAGO . . 810 W. Washington Blvd.
DENVER . . . 1554 Wazee Street

SAN FRANCISCO . . 520 Fourth Street
PORTLAND . . 914 N. W. 14th Avenue
SEATTLE . . 3410 First Avenue South

PRACTICAL OPERATING *Hints* FOR THE PRODUCTION MAN

$5.00 will be paid for each illustrated acceptable contribution. Mail to The Editor, THE OIL WEEKLY, *Houston*

1. SERVICING

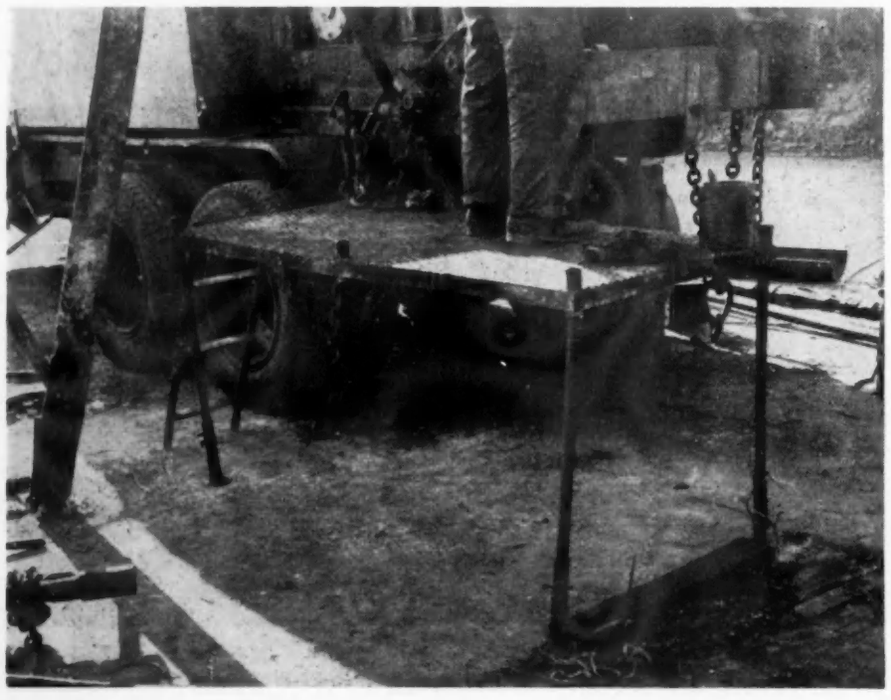
Adjustable Platform Speeds Rig Operation

RIGGING-UP or pulling time is saved by the production crew of one company through the use of a demountable, non-skid-surfaced stand on which the pulling machine operator may stand while operating the unit. Particularly valuable on wells which are not equipped with derricks, or in cases where the derrick floor is at ground level, the stand is strong but light; is adjustable to any height; is easily broken down; and, when not in use, may be stowed away in the lease truck in a matter of only a few minutes.

Area of the stand may be modified to suit individual requirements, but it is unnecessary to have more than three legs built on it. The corner of the pulling unit base serves as a fourth leg, assuring not only a sturdy support, but providing a positive means of spotting the stand at exactly the correct operating level and position for the pulling job. Each of the three pipe legs telescopes into a slightly larger pipe near the base, and by means of a steel pin run through corresponding holes in the two sections, may be adjusted to any desired height.

Short nipples welded to the corners and at intervals along the edge of the stand serve as sockets into which railing uprights may be inserted, should a light line railing be desired as a safety measure. A short pipe ladder hung in holes cut in the outside end of the stand provides easy access for the operator.

Made entirely of scrap materials and requiring but a small amount of the company welder's time, the structure has paid for itself many times over in the time saved in the field.



Adjustable to varying heights on its four supports, and with light stairway at one end, this non-skid steel platform places controls at optimum height for operator.

2. SAFETY

Removable Guard Unit Protects Beam Arc

A COMMON source of accidents around a pumping well is when a man unthinkingly walks under the walking beam between the unit and the well head. If the unit happens to be one of the smaller sizes, the down-travelling horsehead could easily strike him, with perhaps serious injury resulting. To eliminate accidents of this type, the production superintendent of one large company designed a framework which could be installed on any pumping unit, yet be light enough to be easily taken down when the unit or well is to be worked on.

Materials required consist only of two short lengths of sucker rod, one of them being bent into a rectangular shape, and the other a straight piece with hooks on either end. As shown in the photograph, the guard is made up of the rectangular section supported in a horizontal position at about waist level, while one end of the long piece is hooked on to the upper portion of the Sampson post, and the other end is hooked under the outer edge of the horizontal barrier. Two lugs welded to the legs of the Sampson post support the horizontal member on that side. When all sections are hooked in place, the guard is rigid enough to stop a man from walking through that area, yet it is but a minute's work to lift down and lay aside the sections should the well require work.

Light sucker-rod frame, supported by removable hook, closes gap under swing of unit beam.

3. ROD RUNNING

Tubing Stand Holds Break-Out Equipment

EASY accessibility of hand tools does much toward increasing efficiency of the crew on well-pulling jobs. Helping to simplify that problem is a handy tool tray which may be clamped to the top of the tubing while macaroni or rod strings are being pulled. A large collar, or 6-inch length of small casing large

RIGGED FOR THE BEST IN OIL WELL DRILLING

Copies of the above illustrated J-1000 Drilling Rig, suitable for framing, are available on request.

Since days of windjammers around Cape of Good Hope, "good rigging" has been the standard of successful performance. The drilling well that's "Emsco rigged" from crown block to mud pump is assured easier, faster operation on every "tour."

Every piece of Emsco equipment combines durability and dependable functioning with positive control and safety. Ability to handle overloads, and stand up under the toughest service is engineered into Emsco products.

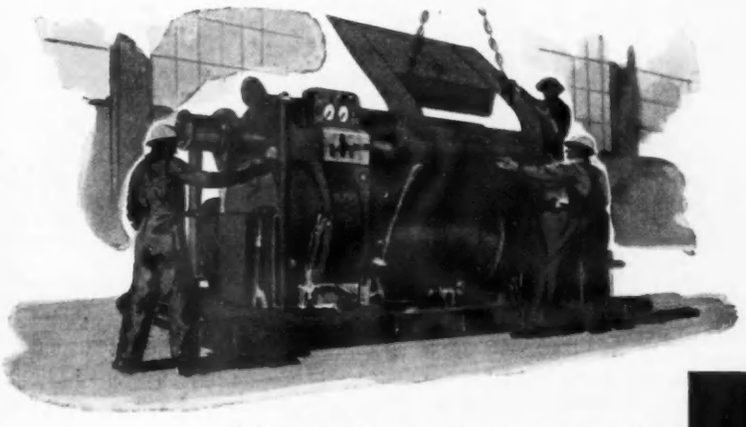
Materials and workmanship reflect Emsco "know how,"—practical experience that started in 1923 and has included installations in every oilfield in the world. On the toughest wells drilled during the past 20 years there's always been Emsco equipment performing satisfactorily. That is why we can refer without hesitation to any driller or roughneck as Emsco's best salesman.

Emsco manufactures a complete line of drilling equipment. Crown blocks, travelling blocks, swivels, rotary tables, draw works, slush pumps, derricks and pumping units bearing the name "Emsco" are giving the oil industry "a good run" for the money everywhere.

EMSCO DERRICK & EQUIPMENT COMPANY

Plants:

LOS ANGELES, CALIF. • DALLAS, TEXAS • HOUSTON, TEXAS



Type J-1000 Drawworks being assembled and factory checked before shipment.

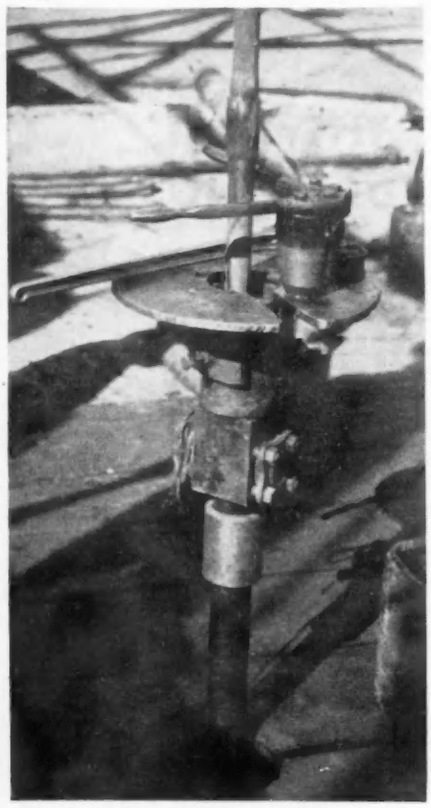
EMSCO

REG. U.S. PAT. OFF.

BROWN
CUTTING & FISHING TOOLS
At your service 8,760 hours a year!
BROWN OIL TOOLS, INC.
Houston • Corpus Christi • Lake Charles
New Iberia • Houma

Rx FOR
LEAK-PROOF CONNECTIONS!
Forged Steel UNIBOLT Couplings employ the most efficient sealing means ever designed for high-pressure steam lines, slush pump manifolds, etc. In addition to the high multiplication of bolt pressure (6½ to 1) provided by the 9 degree tapered shelves, a further reduction is accomplished by the use of a 9 degree taper on each side of the seal ring.
UNIBOLT
THE ONE BOLT COUPLING
THORNHILL-CRAVER COMPANY
HOUSTON

INDUSTRIAL
PACKINGS . . . GASKETS
STEAM SNAP RING
Cut from slab made of plies of long wearing duck inserted in pliable rubber. Will give excellent performance in general service other than where superheated or high pressure steam is used. Style 120, snap ring; 121 Spiral, 123 coil, and 151 solid ring.
Write or wire:
Sterling Packing & Gasket Co., Inc.,
1701 Nance, Houston, Texas
Sterling
MEANS QUALITY



Clamping to tubing collar, this notched disc provides handy location for keeping hand tools.

enough to slip over the top tubing collar, is welded to a 5/16-inch thick circular steel disc, and a narrow slot cut through both to permit slipping it over the string and mounting it on the top of the tubing string. The center of the disc is cut out larger than the slot to permit passing rod boxes and allow use of the spider, the latter shouldering on the edges of the steel plate and not the tubing collar. Two large set screws secure the clamp to the tubing collar.

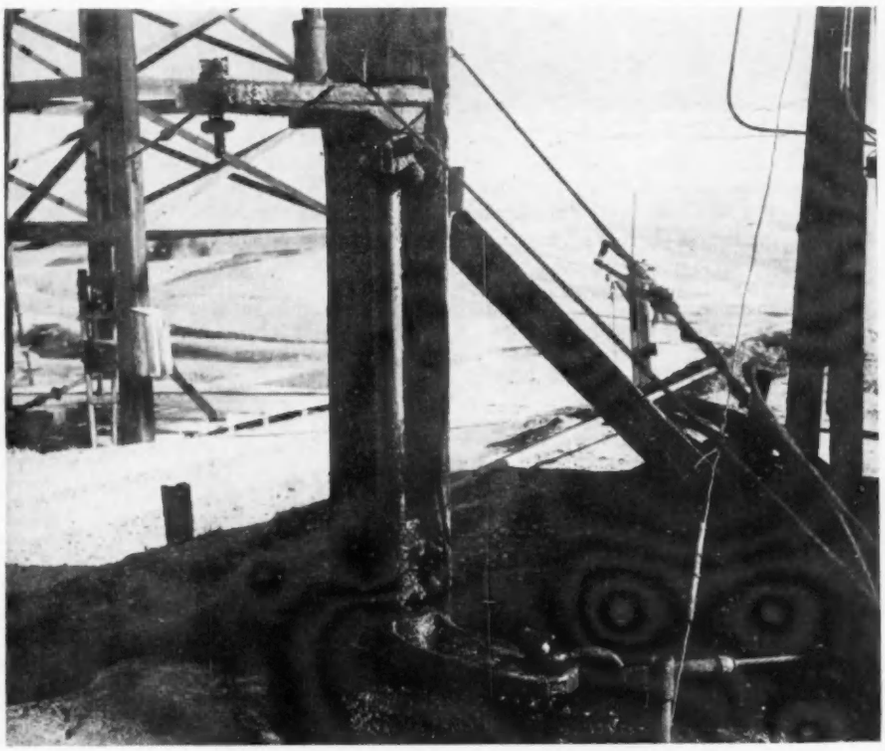
The spider, rod wrenches and other tools may be laid on this handy table and are always within reach no matter from what side the men are working. It is but a minute's work to set it up ready for use, is easily carried in the truck pulling equipment tool box, and in general, is conducive to a cleaner, safer derrick floor during operations.

4. ROD LINES

Salvaged Rig Crank Provides Adjustments

IN RUGGED terrain, problems frequently arise in running jack lines between the central plant and the wells in which overpulls, underpulls, swings or butterflies do not quite supply the required motion. Many such conditions may be solved, however, by some adaptation of two standard-end crank arms and a shaft of suitable length similar to the example shown.

A major producer in one stripper well field solved a difficult motion-transfer problem by mounting the shaft in a vertical position, bolting it to a heavy well-braced 12 x 12-inch timber. The original bearing assemblies were retained and the only modification necessary was relocation and keying the cranks to provide the angle giving the desired motion. Built originally to withstand hard service, a unit of this type will give many years of service, and because of the crank holes already existing in the cranks, stroke adjustments may be made as occasion demands or as well conditions change.



Mounted against sturdily braced timber, this old crank-arm assembly gives clearance and desired take-off angle to rod-line hookup from power-operated well.

☆ ☆ ☆ ☆ WASHINGTON ROUNDUP ☆ ☆ ☆ ☆

Industry and Officials Try to Solve Manpower Problem

IPAA Will Seek Parity Basis for Oil and Products Prices

Technical Details on Pipe Line Hold up Signing of Contract

Pipe Line-Oil Company Divorce Idea Revived by Gillette

By B. F. LINZ,
Washington Correspondent

☆ ☆ ☆ ☆

MANPOWER questions which hold a distinct threat for the oil industry were the major subject of discussion in the national capital last week, as military, production and manpower chiefs sought a formula which would permit the induction of a maximum proportion of skilled workers under 26 with a minimum of interference to war production.

In Congress, the major developments of interest to the industry were the final passage of legislation authorizing the Interior Department to undertake pilot-plant research in the development of synthetic fuels from coal, oil shale and other materials, and the approaching close of the inquiry by the House public lands committee into the Navy's contract with Standard Oil Company of California for operation of the Elk Hills reserve.

At the close of the week, Congress recessed so that members could do a little fence building back home over Easter, but upon its return April 12 things are expected to speed up a little.

First on the calendar will be the resumption of hearings on continuation of the price control act by the Senate banking and currency committee, among the first witnesses scheduled being Russell B. Brown, general counsel of the Independent Petroleum Association of America, who will ask for incorporation in the law of a provision for the pricing of oil and products on a parity basis.

The special 11-man senate committee which is to investigate the Saudi Arabia pipe line and other phases of the world oil situation also is expected to get under way shortly after the recess.

During the week, the industry was warned that the move for the divorcement of pipe lines from other operations, spearheaded by the late Senator Borah, has not been abandoned. In the Senate, Senator Guy M. Gillette of Iowa announced his intention of reviving the legislation after the war.

Voorhis Raises Cry of Tightening Standard Monopoly in Elk Hills Deal

Charges that the projected Navy contract for operation of the Elk Hills reserve by Standard Oil Company of California, would strengthen that company's alleged monopolistic position in California were laid before the House Public Lands Committee March 29 by Representative Jerry Voorhis of California.

Voorhis, who demanded that the Navy condemn all Standard Oil Company holdings in the reserve, tangled with Representative Alfred J. Elliott, in whose district the reserve is located and who is fighting condemnation, because of the loss of taxes to the county, which would result from the withdrawal of the company's lands from the tax rolls.

Meanwhile, there were indications that Voorhis is not alone in his belief that condemnation is the proper way to solve the problem, a movement having been initiated to kill the bill introduced by Senator Walsh, clarifying the basic law so as to remove all doubts of the legality of the proposed contract, and substitute a measure calling for government acquisition of all private holdings in the reserve and for an area of one mile all around it.

Voorhis told the committee that while there is a provision in the contract permitting each party to sell its oil as it desires, actually Standard Oil Company has such "complete control of the price of crude" as to prevent the Navy from selling to the best advantage.

"The only right solution of this problem is the purchase by the Navy of the company's holdings in Elk Hills—by condemnation if necessary," he insisted.

"Some of the people who are telling us that our reserves are dangerously near exhaustion are complaining because the Navy will not permit greater production from Elk Hills," he said, adding that the "pressure to open up the reserve will continue until the whole thing belongs to the Navy."

The proposed unit operation plan, he contended, "will greatly strengthen the monopolistic position which Standard Oil Company now holds." For years, he said, the company has "virtually controlled the price of crude oil in California," and will be in even better position to do so if it obtains control of the Navy's field.

At the same time, he argued, if unit operaton is decided upon, there is no reason for putting the whole reserve under it, since Standard Oil Company owns only 9000 out of 42,000 acres in the "area of commercial production. "If this contract proposed to include only those portions of the Elk Hills field where the company owns part of the land I would not object so strongly," he explained.

Voorhis asserted that to carry out the contract, providing for a 64-36 division of the oil which may be revised later, it will require an army of accountants and lawyers greater than ever employed in the oil or any other industry, and the Navy will never know at any time just where it stands. "The very fact that so much stress is placed on revision of the percentages is proof none knows what they should be," he said.

Pipe Line Divorce Bill on Gillette's Postwar Agenda

Legislation divorcing pipe lines from other operations of integrated oil companies will be reintroduced and pressed as soon as the war exigency is over, it was announced March 28 by Senator Guy M. Gillette of Iowa.

Gillette said he would sponsor the measure if still in Congress and, if not, would try to see that someone else introduces it.

He explained that in the two previous Congresses, he and the late Senator Borah of Idaho introduced divorce measures, but they were not reintroduced in this Congress "because I was led to believe that certain civil suits instituted by the Department of Justice had accomplished the end of denying the profits accruing by way of the operation of these facilities."

However, he added, he inquired of Attorney General Francis Biddle last month regarding the situation, and received a response in which Biddle, while professing inability to submit definite figures, expressed the belief that the pipe-line companies in 1942 had profits in excess of the seven percent of valuation which had been set in the consent decree ending the so-called Elkins Act cases.

Biddle pointed out that the Interstate Commerce Commission has two dockets pending designed to reduce pipe-line tariffs, and said that the other question in which the Senator was interested—the use of the lines by other than the owners—"we are of the opinion that there has been some such use during the present emergency since, at the request of PAW and ODT, the anti-trust division joined with ICC to assure the oil companies that the question of common carrier status would be determined without reference to acts of transportation which are performed exclusively in response to the request or direction of the director of ODT or PAW.

"Without passing upon the merits of legislation, referred to in your letter,"

Biddle concluded, "the department, of course, never intended that litigation be considered as a substitute for legislation designed to divorce pipe lines from their shipper-owners."

Big-Inch Schedule Well Above Rated Capacity

Operation of the Big-Inch pipe line at a level of 310,000 barrels of crude daily, 10,000 barrels above rated capacity, has been scheduled by PAW for the coming three months.

The PAW schedule calls for the delivery to War Emergency Pipelines, Inc., at Longview, of 137,200 barrels daily of East Texas oil, 54,700 barrels of Southwest Texas oil and 118,100 barrels of West Texas oil, with the following monthly quotas to the several companies:

April: East Texas oil: Atlantic Refining Company, 561,000 barrels; Central Pipe Line Company, 30,000; Cities Service Oil Company, 156,000; Humble Oil & Refining Company, 786,000; Magnolia Petroleum Company, 87,000; Pure Oil Company, 468,000; Shell Oil Company, 378,000; Sinclair Prairie Oil Marketing Company, 123,000; Sun Oil Company, 1,008,000; Tide Water Associated Oil Company, 519,000; Southwest Texas oil: Globe Oil and Refining Company, 411,000; Houston Oil Company, 42,000; Humble Oil & Refining Company, 621,000; Magnolia Petroleum Company, 375,000; Sun Oil Company, 192,000; West Texas oil: Atlantic Refining Company, 1,200,000; Gulf Refining Company, 774,000; Humble Oil & Refining Company, 1,269,000; Magnolia Petroleum Company, 300,000.

May: East Texas oil: Atlantic Refining Company, 610,700 barrels; Central Pipe Line Company, 31,000; Cities Service Oil Company, 161,200; Humble Oil & Refining Company, 843,200; Magnolia Petroleum Company, 120,900; Pure Oil Company, 248,000; Shell Oil Company, 421,600; Sinclair Prairie Oil Marketing Company, 158,100; Sun Oil Company, 1,091,200; Tide Water Associated Oil Company, 567,300; Southwest Texas oil: Globe Oil & Refining Company, 424,700; Houston Oil Company, 43,400; Humble Oil & Refining Company, 641,700; Magnolia Petroleum Company, 387,500; Sun Oil Company, 198,400; West Texas oil: Atlantic Refining Company, 1,240,000; Gulf Refining Company, 799,800; Humble Oil & Refining Company, 1,311,300; Magnolia Petroleum Company, 310,000.

June: East Texas oil: Atlantic Refining Company, 591,000 barrels; Central Pipe Line Company, 30,000; Cities Service Oil Company, 156,000; Humble Oil & Refining Company, 816,000; Magnolia Petroleum Company, 117,000; Pure Oil Company, 240,000; Shell Oil Company, 408,000; Sinclair Prairie Oil Marketing Company, 153,000; Sun Oil Company, 1,056,000; Tide Water Associated Oil Company, 549,000; Southwest Texas oil: Globe Oil & Refining Company, 411,000; Houston Oil Company, 42,000; Humble Oil & Refining Company, 621,000; Magnolia Petroleum Company, 375,000; Sun Oil Company, 192,000; West Texas oil: Atlantic Refining Company, 1,200,000; Gulf Refining Company, 774,000; Humble Oil & Refining Company, 1,269,000; Magnolia Petroleum Company, 300,000.

PRC Revamping Expected; Stimson Opposes Dissolution of Agency

Dissolution of Petroleum Reserves Corporation was strongly opposed last week by Secretary of War Henry Stimson.

In a letter to Chairman Burton K. Wheeler of the Senate Interstate Commerce Committee, Stimson pointed out that United States oil is now being taken out of the ground at a rate faster than it is being discovered and, he added, "it seems wise, therefore, to take appropriate steps to assure reserves in foreign lands."

Meanwhile, with most of its key men lost, PRC is expected shortly to be revamped, with more emphasis to be placed on the proper disclosure of its aims and purposes.

Main objective will be to put the agency "right" with the country and avert widespread criticism such as attended the announcement of the Saudi Arabian pipe line project.

To achieve this, there may be less secrecy in the future regarding PRC activities.

At the moment it is understood PRC has no new projects in view, and the signing of the pipe-line contract is said to have been held up because of difficulties over technical details. The suggestion has been put forth that the delay is due to differences between the companies and the agency, rather than to any promise by the latter to hold up action until after the forthcoming investigation by a special 11-man Senate committee.

Preparing to recess for the Easter vacation, the special Senate committee met in executive session March 31 to question Colonel John H. Leavell, State Department petroleum attache at Baghdad who is about to return to his post. The questioning of Leavell was primarily directed at the Middle East oil situation and the PRC pipeline.

PAW Changes

PAW lost one of its key men last week when Frank A. Watts resigned as director of its materials division to return to his position as purchasing agent for Humble Oil & Refining Company at Houston.

He will be succeeded by Claude P. Parsons, since last January assistant chief of the division.

Connected with Humble for nearly a quarter century, broken only by a four-month period when he was a construction engineer for Union Oil Company of California, Watts joined PAW in January, 1943, at the most critical period of the oil-materials shortage. Through his efforts, the needs of the industry for vital materials were met in such a way that continued operation was assured and in recent months he devoted himself to the task of obtaining larger allotments from the War Production Board so as to permit maximum expansion of oil activities.

C. P. PARSONS

Announcing Watts' resignation, Deputy Administrator Davies explained that his materials chief had come to Washington with the understanding that he would be released after a definite period, which twice had been extended.

"I could not again insist that he remain," Davies said.

"It is difficult to express fully my appreciation for the excellent record Mr. Watts made while attached to the PAW staff," he added. "He reorganized the materials division into one of the most efficient units in wartime administration. He came here at a time when the shortage of materials was seriously impairing the work of the petroleum industry. He leaves his post with the more serious problems under control and with a competent staff to carry on."

Parsons, who is with PAW on leave from his position as vice president of the Halliburton Oil Well Cementing Company, became interested in the oil industry while serving as a lieutenant in the air force in the last war, and joined Magnolia Petroleum Company in 1919 as a roustabout, rising to district superintendent before leaving in 1929 to join Halliburton as a field engineer. With Halliburton he was successively, chief engineer, manager of sales and, since 1934, vice president.

Deliveries to East Coast Reduced for the Week

Bad weather and changing product requirements which necessitated the shifting of cars from certain loading points to others cost the East Coast 58,500 barrels of oil a day during the week ended March 25, it was shown by the PAW weekly supply bulletin.

Tank car shipments during the week averaged only 699,109 barrels daily against 757,613 barrels a day during the preceding week, PAW reported. The pipe-line movement, however, safeguarded District 1 from a shortage, the Big-Inch continuing to exceed its rated 300,000 barrel capacity and the Little-Big-Inch running close to its capacity of 180,000 barrels daily.

With the heating season drawing to a close, the chief concern in PAW now is to meet gasoline requirements, which are rising rapidly as farming operations get under way. It was claimed by Deputy Administrator Davies, however, that PAW is confident that it will be able to provide the rationed allocation, although he warned of possibilities of local shortages from time to time.

COMPASS

on its record, today's best buy in oil well transmission belting

◆

● The famous Goodyear Compass Cord transmission belt — now made with oil-resisting synthetic rubber—has an added margin of superiority over other belt constructions.

The Compass belt, for sixteen years, has been first choice on the toughest pump drives because of its patented, balanced cord carcass. The cords carry the load — and they're built to the same prewar quality standard. The rubberized fabric envelope protects the cords from wear, and here Goodyear uses the best oil and abrasion-resistant synthetic rubber.

You know what Compass has done — its records are legion in every oil field. You'll find today's synthetic Compass still better because it benefits from Goodyear's twenty years' experience in improving synthetic rubber. The G.T.M. — Goodyear Technical Man — will be glad to recommend the proper Compass for your drives. Just write Goodyear, Akron 16, Ohio, or Los Angeles 54, California — or phone the nearest Goodyear Industrial Rubber Goods Distributor.

Compass—T. M. The Goodyear Tire & Rubber Company

GOODYEAR INDUSTRIAL RUBBER PRODUCTS
GTM-Specified
COMPASS CORD TRANSMISSION BELT
for oil well service
BALANCED BODY made of heavy rope-cord spiralled continuously without a splice. Cord on opposing sides of belt axis is twisted in opposite directions to neutralize torque of cord.
BALANCED COVER laid parallel to axis of belt — made of fabric in which alternate warp threads are twisted in opposite directions to prevent side-creep.
GOODYEAR
THE GREATEST NAME IN RUBBER

★ TO SPEED VICTORY — BUY WAR BONDS ★

Northern Alaska Naval Reserve to Be Developed if Congress Grants Funds

From Point Barrow, northernmost Alaska, the United States Navy will conduct an intensive exploratory program for new oil reserves, in an area that is a continuation of the interior plains of Coastal Mexico, the United States, and Canada. These plains contain sedimentary formations which have produced oil in fields extending from Mexico and Texas through the Mid-Continent, Rocky Mountain States of the United States and Western Canada to Norman Wells on the Mackenzie River in the Northwest Territories. The Mackenzie River basin, location of Norman Wells field, is considered Canada's most promising region for oil prospecting, and Northern Alaska has similar possibilities.

A reconnaissance engineering party recently went by air to Alaska to make preparations for a wide-scale exploratory program in Naval Petroleum Reserve No. 4 at Point Barrow.

If Congress votes necessary funds, geophysical, geological, and engineering crews, recruited from the personnel of the Navy, will move into Northern Alaska this spring and summer, to obtain definite information on the potential usefulness of the Alaskan reserve.

A statement from the Navy indicated that the Alaskan plans are a part of an expanded program for naval petroleum reserves, "in line with the resurgence of interest in oil as one of the nation's key problems." Broad plans also contemplate further development of the Elk Hills Reserve No. 1, California. The Elk Hills field so far has been explored only to the extent of developing the shallow oil zone at the eastern end of the field, the Navy said, whereas a large area to the west and also the deeper Stevens zone are unexplored.

The reconnaissance group sent to Point Barrow is headed by Lieutenant William T. Foran, geologist, a member of United States Geological Survey parties that made pioneering surveys in Alaska. The group now working with Foran will assemble information on general and special conditions, for guidance in solving problems of transportation, housing, supply, and operations incident to oil development.

The Navy stated that "little is known as to the potentialities of this area of 35,000 square miles at the northernmost tip of Alaska except that oil seepages have been found in several places, but the belief is that it holds large quantities of oil."

Development of fields in that Arctic region obviously would present extremely difficult problems. Point Barrow is 400 miles north of the Arctic Circle. The Alaska Highway reaches north to Fairbanks, but it is 150 miles farther across rugged, mountainous country, to the southern border of the Northern Alaska potential oil region and 300 miles from Fairbanks to Point Barrow. Northern Alaska would be accessible by extension of that highway, by air, via the Mackenzie River route, or by sea for short periods in summer, via the Bering Strait and Arctic Ocean.

From Point Barrow, northernmost Alaska, the United States Navy will investigate possibilities of developing Naval oil reserves between the Arctic coast and the dotted line on this map, an area with important oil possibilities.

Up to now, Alaska's only developed oil production has been the insignificant output along the Pacific Coast, west of Skagway and White Horse, Canada, the Katalla field being in that area.

Synthetic Fuel Measure Is Sent to White House

Legislation authorizing the Interior Department to initiate a $30,000,000 investigation of the possibilities of producing synthetic fuels from coal, shale and other substances, was agreed to by the House and Senate March 28 and sent to the White House for approval.

The measure as finally passed provides for an investigation of the fuel possibilities of agricultural and forestry products, to be undertaken by the Department of Agriculture, and says that, in conducting research and development work, the Interior Department is authorized, with pilot and semi-works plants, to make engineering studies in order to ascertain lowest costs.

The Secretary of the Interior is authorized to acquire patent and other rights, but the authority to acquire interests in lands by condemnation originally conferred is restricted to such land or other property as necessary to carry out the purposes of the act.

The secretary is authorized to grant, on appropriate terms, licenses under patent rights acquired under the act, with a provision that he shall make available to the citizens and corporations of the United States the use of any inventions, discoveries or processes which may be developed in operations under the act as well as those covered by patents which he may acquire. This latter privilege, however, will not apply with respect to patents which are used by the government under license only.

PIWC to Discuss Tire Conservation Campaign

Plans for a new campaign on tire conservation, requested by Rubber Director Bradley Dewey, are expected to be discussed at the April meeting of the Petroleum Industry War Council.

Announcement that the government again was calling on the oil industry through its war council was made March 30 by Chairman William R. Boyd, Jr., who made public a letter from Dewey explaining that until July only slightly more than 1,000,000 passenger-car tires a month will be built, some of which will be held as a reserve to safeguard against any unexpected new emergency.

"This spells a continuing shortage as far as the American civilian is concerned," Dewey pointed out, "and accentuates the need for even greater conservation of tires now. Some carelessness has crept into conservation practices as the rubber-supply situation seemed to approach clarification. Now a renewed effort must be made to extend the life of existing tires."

Crude Oil Production Trend Continues Upward

Crude oil production continued its upward trend over the turn of the year, reaching an average of 4,380,000 barrels a day during January, it was reported last week by the Bureau of Mines.

The average output was 20,000 barrels above that of December and 598,000 barrels, or almost 16 percent, over January, 1943, the most important change over the year-end being the increase in California, where production rose to 812,800 barrels daily.

The bureau noted that oil-well completions dropped to 884 in January from 922 in December, but were 201 above those of the first 1943 month. Total initial production of new wells continued their decline, dropping from 183,800 barrels in December to 163,000 barrels in January.

Daily average demand for domestic crude set a new record at 4,417,200 barrels, a gain of 56,700 barrels over December, and to meet this demand crude stocks of domestic origin were reduced at the rate of 37,600 barrels daily, the bureau reported. Total stocks of foreign and domestic crude at the close of January were 248,097,000 barrels, compared with 249,404,000 barrels December 31.

Crude runs to stills also established a new record, rising 36,000 barrels daily over December to 4,296,000 barrels a day. Total demand for motor fuel was about 35 percent greater than in January, 1943. The gasoline yield rose to 38.6 percent, showing a 2.1 percent gain over the same month last year, and stocks of finished gasoline increased 5,526,000 barrels to a total of 70,490,000 barrels on January 31, but were

BAASH-ROSS

Baash-Ross News

BAASH-ROSS TOOL COMPANY · LOS ANGELES · HOUSTON · NEW YORK

OIL WEEKLY EDITION

FOUR things make this one of the riskiest of all rig operations!

When you use drill pipe slips to support a drill collar in the table, you are practically asking for a costly fishing job. Why? Because, compared with ordinary drill pipe, there are *four* factors that add extra risk to handling drill collars . . .

1. HARD SURFACE. The ends of drill collars are heat-treated in the area where the slips take hold. The resulting hard surface makes it far more difficult for slips to get an adequate grip on the collar!

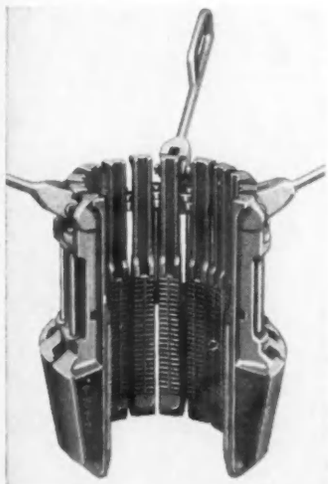
2. NO SHOULDERS. The majority of modern drill collars are made flush top to bottom. This means there are no shoulders to stop the collar from slipping once it has started!

3. VARIABLE DIAMETER. Drill collars, rotating against the abrasive, fresh-cut walls of the hole, rapidly lose diameter. Ordinary fixed curvature slips cannot compensate for this wear, become less and less efficient as collar is used.

4. INSUFFICIENT WEIGHT. All slips depend upon wedging action for grip pressure. When supporting drill collars, usually only the weight of the bottom of the string is available to wedge the slips. This means less effective grip, greater risk of slipping!

BAASH-ROSS DRILL COLLAR SLIPS

ABOVE *"Regular" Type showing how multiple narrow slip segments are flexibly hinged together.* **BELOW** *"Long" Type showing how segments extend above slip area to provide seat for a Baash-Ross Safety Clamp (see page 265 of your 1944 Composite Catalog). Both types have renewable slips for maximum economy.*



Here's the solution . . .

BAASH-ROSS DRILL COLLAR SLIPS!

These slips are *specifically engineered* to eliminate one of the riskiest of all rig operations . . . supporting a drill collar through the table with "fixed diameter" slips.

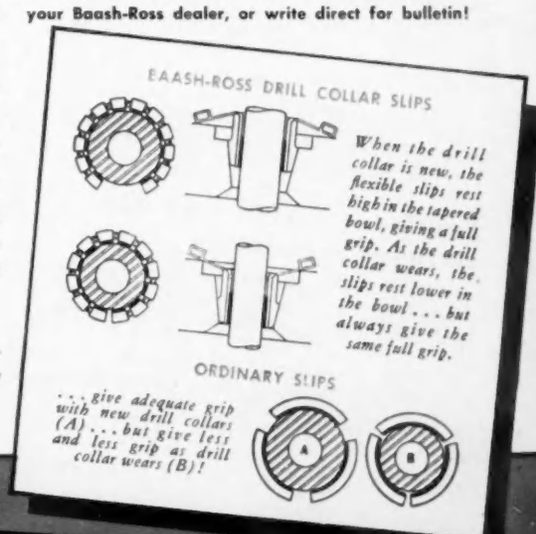
They differ from ordinary slips in that they are made up of many narrow segments *flexibly hinged together* to insure an adequate, full-diameter grip on the collar at all times and under all conditions. They w-r-a-p around the collar like a chain tong, fitting every inch of the circumference whether the collar is new, old, round or out-of-round!

Compare this *full*-circumferential grip with the partial grip provided by ordinary "fixed-diameter" slips . . . that is, slips designed to fit a certain diameter pipe *and that diameter only*. Trouble is, drill collars don't have a "fixed" diameter. Their constant rotation against the abrasive, fresh-cut walls of the hole causes them to wear rapidly. And they not only become smaller in diameter, but often out-of-round as well. Ordinary rigid type slips cannot compensate for this wear (see illustration) . . . consequently grip the collar less and less securely. This reduced gripping area—combined with a hardened surface, insufficient weight and flush construction—make the use of rigid type slips to hold drill collars an invitation for a costly fishing job!

But the Baash-Ross Drill Collar Slips practically eliminate these risks by the full-area grip they take on any drill collar, regardless of its shape or diameter. They are one of the best safeguards you can put on your rig!

TWO TYPES—WIDE RANGE OF SIZES. Baash-Ross Drill Collar Slips are available in two types—"Regular" and "Long." The "Long" type has extensions above the slip surface providing a seat for a Baash-Ross Safety Clamp for *double* protection. Both types have interchangeable liners for long life, low maintenance. Both are available in sizes to fit all diameters of drill collars, each size handling a variation of 1½" in diameter.

Get the full story on this important safeguard from your Baash-Ross dealer, or write direct for bulletin!


BAASH-ROSS DRILL COLLAR SLIPS
When the drill collar is new, the flexible slips rest high in the tapered bowl, giving a full grip. As the drill collar wears, the slips rest lower in the bowl . . . but always give the same full grip.
ORDINARY SLIPS
. . . give adequate grip with new drill collars (A) . . . but give less and less grip as drill collar wears (B)!
A
B

about 8,000,000 barrels under those of the same date in 1943.

"In view of the rapidly expanding war demands for motor fuel, total demands in 1944 may well exceed all previous records," the bureau commented.

The bureau's monthly "balance sheet" showed total output of domestic crude at 135,767,000 barrels in January against 135,152,000 barrels in December, and natural gasoline and benzol at 8,021,000 barrels against 7,998,000 barrels, a total production of 143,788,000 barrels against 143,150,000 barrels.

Stocks at the close of the month included 241,245,000 barrels of gasoline-bearing crude against 242,132,000 barrels December 31; 6,852,000 barrels of heavy crude in California against 7,272,000 barrels; 4,296,000 barrels of natural gasoline against 4,541,000 barrels, and 227,324,000 barrels of refined products against 229,362,000 barrels, a total, all oils of 479,717,000 barrels against 483,307,000 barrels.

Bureau of Labor Statistics' compilations placed the price index for petroleum and products at 63.5 for January, the same as for December, compared with 60.8 for January, 1943. The crude capacity represented by the data in the report was 4,747,000 barrels on a new revised basis just adopted by the bureau, indicating an operating ratio of about 90 percent, compared with 79 percent for January, 1943.

PAW Approval of Access Roads Will Be Required

All applications for authority to build access roads to petroleum fields will hereafter be referred by regional offices of the Federal Works Agency to the appropriate PAW district director of production for approval before being submitted to WPB for certification, under orders issued last week by Public Roads Commissioner Thomas H. MacDonald.

It was explained that the percentage of proposed projects to sources of raw materials on which certification is denied has increased rapidly during recent months, largely because the current supply of some raw materials in certain areas is adequate to take care of demand.

In the case of oil field roads, however, the Public Roads Administration will be guided by the action of the PAW officials.

Gulf Service Awards

Service awards representing ten or more years service with the company will be given to 4448 men and women of Gulf Oil Corporation and its subsidiaries, in the near future.

Of the 4448 employees in the company's offices in 30 states to receive jeweled emblems and certificates, 1960 have completed 10 years; 1052, 15 years; 915, 20 years; 389, 25 years; 89, 30 years; 30, 35 years; and 13 have rounded out 40 years of service. This marks the fifth annual distribution of awards and altogether 14,884 employees with 10 or more years of service have been honored.

Southwestern District API To Meet in Houston

The regular spring meeting of the Southwestern District API Division of Production will be held in the Rice Hotel, Houston, June 13 and 14. The program, in process of formulation, will include papers on drilling and production topics.

Parity Price Basis for Oil Ceiling To Be Suggested at April 12 Hearing

Amendment of the Price Control Act to require that ceiling prices for crude oil and products shall be fixed on a basis of parity for the former will be urged before the Senate Banking and Currency Committee April 12 by Russell B. Brown, general counsel of the Independent Petroleum Association.

Brown's appearance before the committee, which is holding hearings on extension of the act for another year, will be the first step in a campaign by oil interests to secure a specific formula for the fixing of oil prices, which for more than two years have been an OPA football. Similar hearings will be held by a House committee after the Easter recess.

As tentatively drafted in advance of the hearings, Brown's recommended amendment will provide that:

"In establishing or maintaining maximum price ceilings for crude petroleum and the products thereof or derivatives therefrom under the provisions of this Act, or under any other provisions of law, consideration shall be given to the necessity for finding, developing and producing crude petroleum in sufficient quantity to insure an adequate supply to meet demands for war, industrial and civilian requirements, to the conservation of our petroleum reserves and to the cost of finding, developing and producing crude petroleum including the replacement costs of such petroleum. Consideration shall also be given to the parity relationship between the index number of crude petroleum based on the national weighted average price of crude petroleum and the index number of 'all commodities' as reported by the United States Department of Labor, Bureau of Labor Statistics, under the title of 'Average Wholesale Prices and Index Numbers' in said Bureau's wholesale commodity price index, based on the year 1926; provided, however, that such ceilings on crude petroleum shall not be fixed or maintained at less than parity as described herein with supporting and compensatory price ceilings for the produtcs of crude petroleum or the derivatives therefrom."

Hand Tool Change

PAW Priorities Circular No. 6, relating to the acquisition of hand tools by petroleum operators for resale to employes, was revoked by PAW March 24, and a new procedure adopted which authorizes the use by employes of their employer's MRO preference rating to obtain the necessary hand tools and safety equipment required in connection with their work.

Further Cut in Civilian Driving Said Possible

Having "backed into" gasoline rationing, in the East because of the transportation situation and in the rest of the country as a means of saving rubber, OPA now is having difficulty convincing the public that rationing is necessary because of a shortage of the gasoline itself, it was admitted last week by Deputy Price Administrator Bryan Houston.

Houston warned of possible cuts in some categories of civilian driving may be necessary within the next few months, if black markets and non-essential consumption are not controlled, because of the limited additional supplies now foreseen to take care of the seasonal agricultural demand.

For the second quarter of this year, he said, the available supply will be not quite 13 percent more than for the first quarter, whereas last year there was 18 percent more motor fuel for the second quarter. At the same time, he said, consumption for the first quarter this year ran slightly above quota.

IPAA Head Takes Issue With Knox on Pipe Line

Taking sharp issue with Secretary of the Navy Frank Knox, on the proposed trans-Arabian pipe line, Ralph T. Zook, president of Independent Petroleum Association of America, in replying to the secretary's statement that people who oppose the line are "selfish," declared that the project could easily lead us into a national crisis. "It is an easy thing to call an industry 'selfish'," Zook asserted. "It is a bad thing to do in this case. This proposal instead of protecting the United States in the event of war, can readily lead us into a third world war."

The statement stressed that if England and Russia are our allies then the United States does not need to go into the oil business in Arabia. If in the future they should prove to be our enemies, the development of potential production in the Arabian area would be for their use. "The billion barrels oil so freely quoted as the amount that the United States will acquire in this area is an illusion," Zook said. "All of the oil of all our nationals is available for use in time of war, wherever situated."

"Hundreds of thousands of square miles of potential oil territory within the United States that have never been prospected," constitute the best argument against the project, in Zook's opinion. "Turn the domestic producer loose from the restrictions under which he has been working for the past two and one half years, give him the same consideration that our government is giving to the nationals of Mexico, Canada, Venezuela, and Arabia, and he will go after new oil by drilling thousands of new wells at his own cost. There are also hundreds of thousands of square miles of prospective oil territory in Canada, Mexico and South America."

"If he is unsuccessful within the confines of the United States, then by all means let him develop oil production in the Western Hemisphere which is the natural sphere of influence and where the sea lanes can be more readily protected."

Fearful that the action of Petroleum Reserve Corporation in backing the line indicates a new American policy on foreign oil, the speaker demanded that "If this proposed entry of the govern-

thugs this "Underground"!

WHEN the history of this war is written, a star-studded chapter belongs to the heroes and heroines who carry on the "underground" activities in Europe's occupied countries.

Daily, they face death or Gestapo torture. Yet, daily, their work goes on—hampering the enemy in every possible way—helping to bring Victory closer.

Less heroic, but nevertheless effective in contributing to the final Axis downfall, is an American "underground" right here at home. It operates day and night to supply our armed forces and essential industries with fuel and lubrication vital to the progress of the war.

It is an "underground" of *steel line pipe*—a network of steel arteries covering vast sections of the country. Much of it was laid years ago by far-seeing leaders of the petroleum industry, and—

MORE THAN 30,000 MILES OF IT IS REPUBLIC ELECTRIC WELD LINE PIPE

Ever alert to the needs of industry, Republic Steel long ago foresaw the advantages consistently obtainable in tubular goods *ONLY* through electric resistance welding.

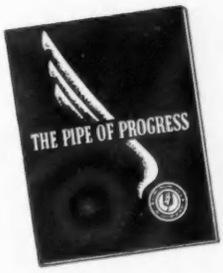
Republic already had the *pioneer* process—which had been developed by one of its manufacturing divisions. By adapting this method to the manufacture of oil country goods, Republic produced its first *electric weld* line pipe more than 15 years ago.

This new product met every test required of line pipe. When the industry began to install it in 1929, its economy in installation was quickly apparent. Since then *MORE THAN 30,000 MILES HAVE BEEN INSTALLED*—and each succeeding year brings the addition of new records for *safety and dependability.*

Today, Republic *Electric Weld* Line Pipe is operating successfully at pressures several hundred pounds above those for which it was made—*passing the most severe test of all, in line service.*

Companion products—made by the same time-proved process—have set records, too! Some 50,000,000 feet of Republic *Electric Weld* Casing and Tubing have demonstrated their reliability. And more than 120,000,000 feet of Electrunite Boiler and Heat Exchanger Tubes made by Republic's Steel and Tubes Division have been placed in service.

Today, improvements in the process, more rigid control at every step and *HOURLY* tests insure as close to 100% successful performance as human ingenuity and accuracy can produce.



Write for a copy of "The Pipe of Progress". You'll find its pictorial description of the Republic process most interesting.

REPUBLIC STEEL CORPORATION
General Offices: Cleveland 1, Ohio
Berger Manufacturing Division • Culvert Division
Niles Steel Products Division • Steel and Tubes Division
Union Drawn Steel Division • Truscon Steel Company
• • Export Department: Chrysler Building, New York 17, New York • •

"LINE-TESTED" ELECTRIC WELD LINE PIPE

ment into the oil business is the 'birth of a genuine American policy on foreign oil,' then it should die in the cradle or the public should be fully informed. It should not be undertaken by a few cabinet members or chiefs of staff under the guise of military secrecy and should be developed with the understanding of the American people through their elected representatives."

Pew Thinks Pipe Line May Mean Another War

Challenging the necessity for the proposed Arabian pipe line and seeing definite possibilities that maintenance of the line might involve America in another war, J. Edgar Pew, vice president of Sun Oil Company, Philadelphia, recently advised against the project.

Pew pointed out this country already has control over sufficient petroleum reserves on the Bahrein Island near the head of the Persian Gulf and the Arabian concession adjacent thereto, to protect us in an emergency. Also there is a modern refinery already built on Bahrein Island. In the face of these facts, the proposed pipe line is "an extravagant waste of public funds," in Pew's opinion.

Part of his statement follows:

"The United States government now proposes to build a pipe line from these fields across Arabia and Palestine to the Mediterranean, a distance of 1250 to 1400 miles, depending on the location of the Mediterranean terminus. The actual building of this line will cost probably from $130,000,000 to $150,000,000; even more, depending on conditions yet unknown.

"It has been suggested that the government will build a naval terminal at the end of this pipe line and possibly a refinery. All of these expenditures by the government may easily exceed $500,000,000.

"The line would pass through an area, largely desert, peopled by at least four contentious elements with conflicting boundaries and racial problems England has tried for years to reconcile.

"Such a terminal could hardly be built and maintained without adequate defense. A pipe line across this country would be subject continuously to sabotage which could be prevented only by liberal tributes to conflicting interests or by armed protection along its entire length. In either event, the cost would be vast.

"The necessity for the defense of this line and the base at the eastern end of the Mediterranean might put the United States into war quickly and without any option on the part of the people as to whether we wanted to go to war. Certainly, the government would have to protect these installations immediately in case of any new war."

Norway Leases Tanker

Transfer to the Royal Norwegian government of a tanker, to be operated under Norwegian registry on a bareboat out, time charter back, basis, was announced by the War Shipping Administration March 28.

Transfer of a T2-SE-A1 tanker to Norway was previously approved but the vessel has not been delivered.

A total of 14 vessels, including the tanker, have been transferred to Norway, it was reported.

Adrian Moore Quit PAW Protesting Further Federal Control of Drilling

Adrian Moore resigned as PAW District 3 director of production because he is of the opinion there no longer exists any need for federal agency control of oil-industry drilling, and that such rules are hindering rather than aiding the war effort.

His views were revealed when THE OIL WEEKLY asked Moore his reasons for resigning. That the industry may be advised of his opinion, his statement is published in full:

"In answer to your request of March 28, I am writing you some of my reasons for resigning as district director of production of Petroleum Administration for War for District 3.

"The principal reason advanced for the assumption of control over drilling oil wells by this federal agency was the scarcity of critical materials. The War Production Board has now made available to the petroleum industry a supply of materials at least sufficient to drill the number of wells that available manpower can accomplish. Therefore, the excuse for continued control over drilling by the production division no longer exists.

"With the maze of technicalities that have to be complied with, the unfair and inequitable spacing rules prescribed by PAO-11, the so-called independent or 'little man' in the oil business is needlessly, if not hopelessly, handicapped by this PAW order. The large organizations with their legal, geological, and engineering staffs can carry on but with an unnecessary expenditure of wasted time, effort, and money.

"It is my definite opinion that industry, whether large or small, can operate more efficiently as a free enterprise than it can under bureaucratic control. It is a God's blessing that under the system of free enterprise that existed prior to the war, oil reserves of sufficient magnitude had already been built up to win the war. If these fields had not been discovered and developed prior to 1941, when PAW came into existence, our national plight would be desperate.

"For months I advocated a revision of the federal order to bring it into conformity with the established rules of our state regulatory authorities. As opposed to the nationwide dictum prescribing federal rules without hearings, our state authorities, after hearings, promulgate field rules based on the evidence submitted by the operators. Only needless confusion results from this conflict between federal and state rules, but up to this time Washington has refused to yield to my request and the authority of our constituted state officials is relegated to the background.

"By appropriate resolutions, the return of control over drilling oil wells to state authorities is now advocated by the Governor of Texas, the Texas Railroad Commission, the American Association of Petroleum Geologists, the Mid-Continent Oil and Gas Association of Texas, the Petroleum Industry General Committee for District 3, the Production Committee for District 3, and various functional sub-committees for District 3. These industry committees were appointed by Secretary Ickes, petroleum administrator, to advise and counsel with Petroleum Administration for War. Now that this unanimity of opinion has been so definitely expressed, it will be interesting to observe whether this theory of federal control so deeply embedded in Washington can be uprooted. If my efforts have had any part in accomplishing this result, I feel that the time I spent with the Petroleum Administration for War was not entirely wasted."

District 3 Wants PAW To Lift Spacing Rules

Two oil-industry committees of District 3 last week petitioned PAW to immediately remove federal restrictions on well spacing in those states where conservation statutes have been enacted, and one of the committees went further by asking revocation of other restrictive orders.

The Petroleum Industry General Committee for District 3 adopted a resolution on March 29 asking PAW to revoke all restrictive orders and directives now in effect except those (a) requiring and supporting the collection and dissemination of data; (b) the scheduling of operations and movement; and (c) requiring the cooperative, concerted, joint, coordinated, connected, or related actions by different individual units in the industry.

The general committee also endorsed a resolution adopted two days earlier by the Petroleum Industry Production Committee for District 3. This resolution petitioned PAW to immediately revise PAO-11 so that its terms would not be applicable to the states of Arkansas, Louisiana, New Mexico and Texas, where, it was stated, there are adequate conservation laws and competent regulatory bodies experienced in regulating the drilling of wells to fit local situations.

The resolution, after pointing out that an increase in the number of wells drilled is necessary to provide more oil for the war effort and that steel had been allocated for 24,000 wells in 1944, declared that PAO-11 is handicapping the drilling of wells because it involves (a) waste of badly needed manpower in preparation of applications by the industry and processing of these applications by PAW, and (b) loss of actual drilling time in awaiting approval of applications.

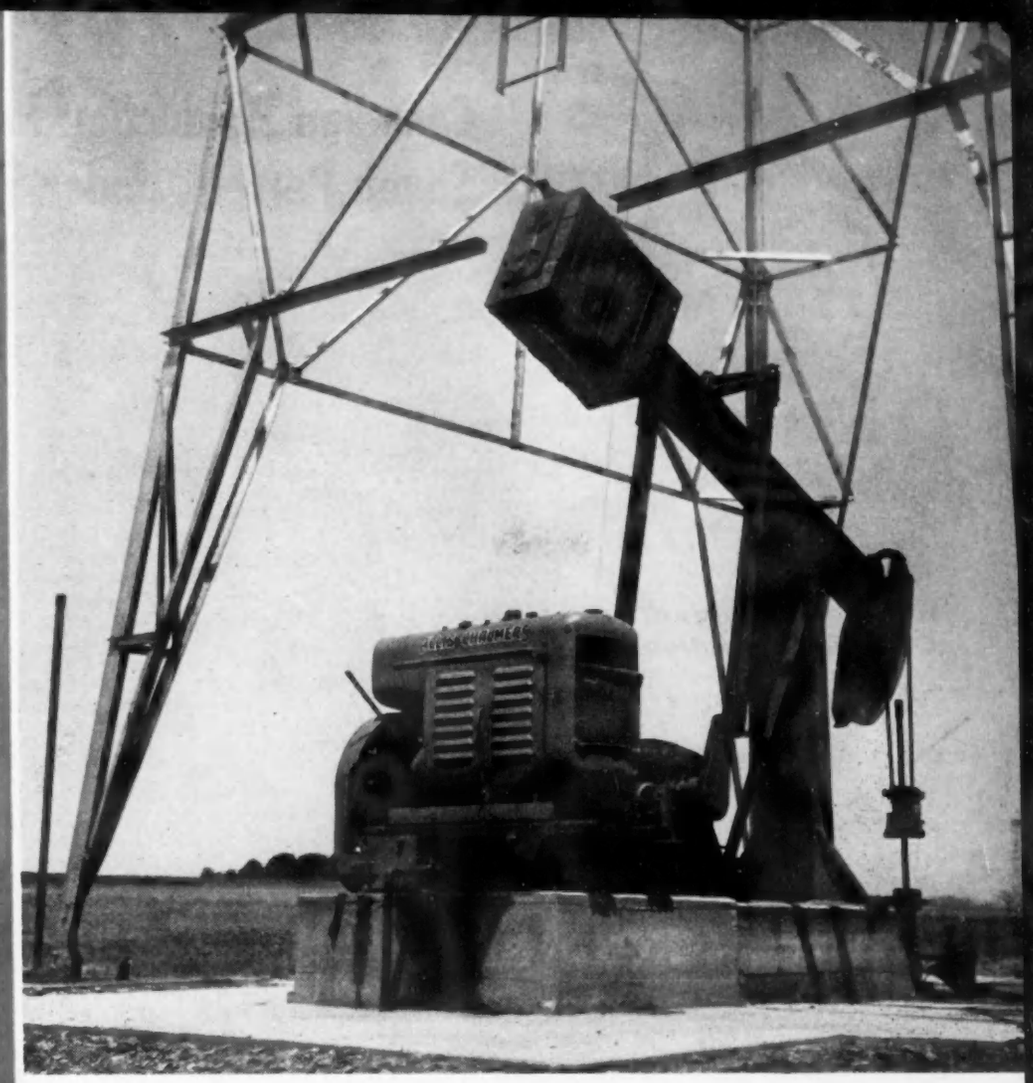
Removal of restrictions, the resolution continued, would better enable the industry to utilize its limited manpower in an attempt to approach the PAW drilling program.

Says Federal Control Is Sure Unless Fight Made

PAW was attacked in a letter to Texas Governor Coke Stevenson last week by Adrian Moore, former PAW director of production for District 3, who endorsed the proposal of the governor that the powers of PAW be curtailed.

"Despising bureaucratic control of industry as I do," Moore wrote, "it was

This A-C Unit is NOT waiting for parts!



Producers who are depending on Allis-Chalmers Engines to keep their wells producing have not had to shut their wells down because of engine failures or lack of repair parts that naturally occur under the pressure of war-time operation.

The inherent quality in all 5 sizes of A-C Engines makes them run longer before service and repairs are needed. The Cooper organization sells engines *only* to the petroleum industry, so has been able to devote its entire service and repair departments to the one job of keeping oil wells pumping. Don't hesitate to order genuine Allis-Chalmers parts when your engines need repairs — our supply is good.

Left—A partial view of our well-stocked parts department in the Tulsa plant.

FRED E. Cooper

Hale Station, TULSA, OKLAHOMA
PHONE 7191 BOX 1890
BRANCH—9619 South Main St. Los Angeles
BRANCH—1415 Franklin St. Houston

with many misgivings that I accepted the job of district director eleven months ago.

"Convinced that materials are now sufficiently plentiful to permit the drilling of more wells than available manpower can accomplish, unable after months of effort to prevail on Washington to amend federal rules to conform with equitable established state rules, and firmly believing that the rules of the production division of PAW constitute a hindrance rather than an aid to the war effort, I tendered my resignation and it became effective March 18.

"Irrespective of representation and promises of Washington officialdom to the contrary, it is my belief that permanent federal control of the oil industry is an established fact unless industry joins with state officials in presenting a united effort to regain regulations of this business by the oil-producing states.

"Your recommendation deserves the unqualified support of the oil industry."

Nixon Asks Relaxation Of PAW Regulations

The oil industry could drill 24,000 wells this year ,as requested by the government, if Administrator Ickes of PAW would return to the states control over spacing and other production matters, Maston Nixon, president of Texas Mid-Continent Oil & Gas Association, said March 30 in a talk in Houston. "This, plus fair treatment by OPA on oil prices, would permit the industry to give the American people all the gasoline and other petroleum products needed during our lifetime and the lifetime of our children," he declared.

"We are asking Ickes to make good on his promise to relax restrictions as soon as they are not needed," Nixon said. "The industry has cooperated fully with the coordinator and has made him look good on the job. We have a half billion more barrels in our known reserves than we had when war started, this despite huge military demands. And we are not through yet. But it will take a change in the attitude of the OPA which says we are not entitled to more money for crude oil."

Nixon pleaded for the unshackling of the industry "so it can drill wells and produce more oil—so that it can go down a road that is known and proven rather than take a chance with the economy of the country by traveling a road that is completely unknown."

Pennsylvania Approves Stand Against PAW

Governor Edward Martin of Pennsylvania advised Texas Governor Coke Stevenson, this week, that Pennsylvania is in "full accord with the latter's statement that the time has come for the states to recover their sovereign rights in oil matters." Pennsylvania, according to its governor, is ready to join other states in a move to return to the states exclusive regulation of spacing, drilling, and operation of oil and gas wells.

Kansas Allowable

The Kansas State Corporation Commission fixed the April allowable production of Kansas crude oil at 275,000 barrels daily, unchanged from March. At the commission hearing at Wichita on March 25, purchasers set their April requirements at 349,810 barrels daily, compared with nominations of 348,824 barrels in March.

Canadian Production for 1943 Drops Seven Percent Under Figure for 1942

In reflection of declining output at Turner Valley, Canada produced about 7 percent less petroleum in 1943 than in 1942—9,377,241 barrels against 10,050,544. At the end of the year, production was averaging 23,775 barrels daily. The 1943 production brought the country's cumulative output up to 100,762,919 barrels.

Turner Valley field, Alberta, dominates these national figures, although data on cumulative production include important former production in Ontario. Across Lake Erie from the old Pennsylvania-New York fields, the pools of Ontario date back to the time of the Drake well and through 1943 they had produced 39,040,123 barrels. However, only 138,457 barrels of production was accounted for in 1943, and output at the end of the year was but 370 barrels daily. The only other production in Eastern Canada has been that in New Brunswick: 25,405 barrels in 1943, increasing cumulative to 344,425 barrels, with output averaging 60 barrels daily in the latter part of the year.

In Western Canada, production has been confined to the province of Alberta with exception of the limited amount in the Norman Wells area, Northwest Territories. That pool produced 37,521 barrels in 1942 from several wells, bringing cumulative to 143,049 barrels, but censorship has ruled out figures on 1943 production, although it was revealed that 27 oil wells had been completed up to November, 1943, mainly under the Canol program.

Alberta's production in 1943 totaled 9,213,379 barrels, compared with 9,841,054 in 1942, and cumulative at end of 1943 was 61,235,322 barrels, while current production at that time was averaging 23,345 barrels daily from 300 wells.

Turner Valley mainly accounted for these figures on Alberta, having produced 8,991,528 barrels in 1943, against 9,701,719 in 1942, and having shown cumulative of 60,274,276 barrels at the end of 1943, with current production at that time of 22,551 barrels daily from 249 wells.

In Alberta outside Turner Valley, production increased to 221,851 barrels in 1943 from 139,335 in 1942, and cumulative at the end of 1943 was 961,046 barrels, while current production was 794 barrels daily from 51 wells. Vermilion was the leading Alberta field outside Turner Valley, with 516 barrels production daily from 29 wells in December, 1943, while Taber was the next most important in production, yielding 175 barrels daily from 4 wells, followed by Wainwright with 43 daily from 7 wells, and Red Coulee with 25 daily from 7 wells. Remaining producing fields of Alberta in December, 1943, were 1-well pools, including Armelgra with output of 15 barrels daily, Lloydminster with 8 barrels daily, Del Bonita 7 daily, and Moose Dome 5 barrels daily.

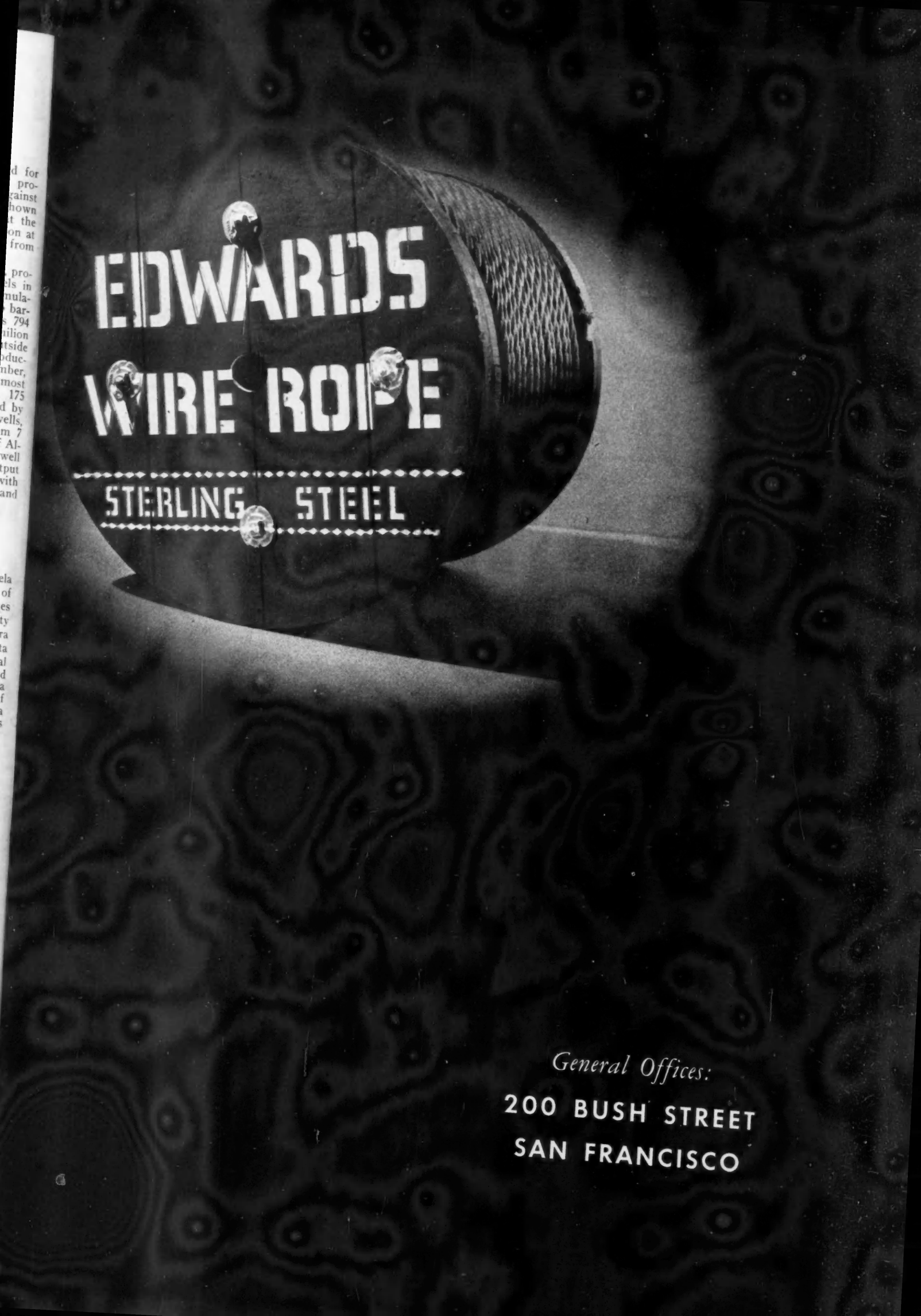
Venezuela Petroleum to Expand Its Operations

The annual report of the Venezuela Petroleum Company, a subsidiary of Sinclair Oil Corporation, announces plans for increasing carrying capacity of the pipe line from the Santa Barbara area to the seacoast terminal at Puerta La Cruz by 35,000 barrels daily—a total of 75,000 barrels. Seventy wells had been completed in the Santa Barbara and Muri concessions up to the end of 1943, and that the company's Puerta La Cruz terminal shipped 3,581,098 barrels of crude oil during the year.

Producing Oil Wells and Current and Cumulative Production of Petroleum in Canadian Fields

FIELD, COUNTY	Year of Discovery	Oil Producing Wells at End of 1943	CRUDE OIL PRODUCTION—(Barrels) Daily at End of 1943	Year 1942	Year 1943	Cumulative Through 1943
New Brunswick	1909	*	60	26,879	[2]25,405	344,425
Ontario	1862	*	370	145,090	[2]138,457	39,040,123
Northwest Territories (Norman Wells)	1920	[4]27	*	37,521	*	[1]143,049
Alberta	1904	300	23,345	9,841,054	9,213,379	61,235,322
Turner Valley	1914	249	22,551	9,701,719	8,991,528	60,274,276
Shallow Zone	1914	3	14	5,806	4,865	482,411
Limestone Zone (Gas Wells)	1925	32	94	[3]27,650	46,465	8,190,449
Limestone Zone (Oil Wells)	1930	214	22,443	[3]9,668,263	8,940,198	51,601,416
Alberta Outside Turner Valley	....	51	794	139,335	221,851	961,046
Red Coulee (light crude)	1929	7	25	10,107	8,928	324,876
Vermilion	1939	29	516	63,793	93,258	183,147
Wainwright	1926	7	43	14,510	18,136	189,399
Taber	1937	4	175	29,819	88,735	143,572
Armelgra	1943	1	15	....	462	462
Dina	1929	....	....	2,780	200	37,352
Del Bonita (incl. close localities)	1937	1	7	1,653	1,882	17,404
Kehoe	1933	....	....	....	....	955
Lloydminster	1939	1	8	477	2,640	5,529
Moose Dome	1937	1	5	....	2,205	8,349
Princess	1941	....	....	10,478	340	30,920
Skiff	1927	....	....	....	....	8,298
Tilley	1942	....	....	5,718	5,065	10,783
Total, Canada	....	[5]327	23,775	10,050,544	9,377,241	100,762,919

* Data not available. [1] Cumulative through 1942. [2] December production estimated. [3] Before transferring high gas/oil ratio wells to gas well list. [4] Completed oil wells as of 11-1-43; mostly shut in awaiting Canol project completion. [5] Includes only wells in Alberta and Northwest Territories.



General Offices:

200 BUSH STREET

SAN FRANCISCO

All Current Crude Production Plus Drafts On Storage Needed to Meet Need for Oils

The industry continues to process near-record volumes of crude oil at refineries, charging to stills more crude than the nation is producing, by drawing on storage. Only by this means are requirements of petroleum products being met without seriously impairing inventory positions of the products. Naturally, therefore, no improvement of inventories is occurring or likely to occur.

Crude oil production showed no change from the previous week in averaging 4,385,000 barrels per day in the 7 days ended March 25, American Petroleum Institute figures showed. The wells were turning out only about 50,000 barrels a day less than they did at the all-time peak of last November and 489,000 barrels per day or 12.6 percent more than in the week ended March 27 last year.

However, the domestic output of oil was too low to meet refinery requirements, as plants in the week of March 25 charged to stills 4,443,000 barrels daily, compared with the 4,385,000 barrels daily of production, a difference of 58,000 daily. In the preceding week, too, runs had exceeded production by a similar margin and during that week it was necessary to draw on stocks to the extent of 90,000 barrels per day, with some of the current production used as fuel or lost in handling. Figures on imports are not available, but from foregoing data it appears that considerable crude is being imported, yet without bringing current supply fully up in line with demand.

In averaging 4,443,000 barrels per day in the week of March 25, runs to stills were within 10,000 barrels of the all-time high reached around New Year this year and exceeded runs in the corresponding week last year by the 722,000 barrels daily or 19.4 percent. This increase is in line with and indicative of the similar expansion which has occurred in the demand for products.

Through benefit of the heavy runs to stills, production of the major products was sufficient to make for normal changes in stocks. There was a fair seasonal accumulation of gasoline in stor-

Several revisions in crude-oil prices are being worked out by OPA. One will authorize sale of crude for fuel at same ceilings as on fuel oils, instead of at crude ceilings as heretofore. Canyon field, Los Angeles County, California, will be given increases of 1 to 8 cents a barrel in crude prices, depending on gravity; and Beverly Hills field, same county, will be given an 8-cent-a-barrel increase, to put it on same posting as the nearby Wilmington field.

(Complete price schedules for all United States fields were last published in *The Oil Weekly* of February 7, 1944, pages 42-43).

Crude Oil Production in the United States

(Estimates compiled by The OIL WEEKLY. All figures indicate daily averages, in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED April 1	March 25
Alabama	25	25
Arkansas	79,650	79,300
California	827,350	830,050
Long Beach	29,850	29,950
Midway-Sunset	56,400	56,600
Kettleman Hills	42,300	42,550
Wilmington	102,250	102,500
Rest of State	596,550	598,450
Colorado	8,200	7,850
Florida	45	45
Illinois	215,800	216,800
Salem	25,500	26,500
Louden	29,700	35,200
Other New Pools	150,300	144,100
Old Pools	10,300	11,000
Indiana	13,600	15,000
Kansas	270,200	277,700
Kentucky	22,400	24,500
Louisiana	360,150	360,500
North Louisiana	76,150	76,500
South Louisiana	284,000	284,000
Michigan	50,950	53,000
Mississippi	42,100	42,400
Missouri	100	100
Montana	24,010	23,320
Nebraska	1,250	1,260
New Mexico	113,050	113,000
New York	13,000	13,300
Ohio	8,600	8,800
Oklahoma	330,400	329,600
Oklahoma City	46,500	46,300
Seminole Area	68,150	67,550
Rest of State	215,750	215,750
Pennsylvania	39,400	40,000
Tennessee	30	30
Texas	1,863,600	1,863,300
Upper Gulf Coast	513,900	513,750
East Texas Field	365,000	365,100
Rest of Eastern Texas	116,750	116,500
Lower Gulf Coast	196,900	197,000
Southwest Texas	74,800	74,700
South Central Texas	19,850	20,000
West Texas	341,000	341,000
North Texas	142,500	142,450
Panhandle	92,900	92,800
West Virginia	8,000	8,300
Wyoming	91,350	92,800
Total United States	4,383,260	4,400,980

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All figures in thousands of barrels—add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod. Barrels Daily	Week Ended	Runs to Stills Barrels Daily	Week Ended	Crude Stocks Barrels	Week Ended	Gasoline Stocks Barrels	Week Ended	Gasoil and Distillate Stocks Barrels	Week Ended	Residual Fuel Oil Stocks Barrels	Week Ended
Highs:												
1941	4,337	11-22	4,120	10-18	266,187	3-29	99,727	3-29	[1]54,983	11-15	102,448	1- 4
1942	4,337	2- 7	3,961	1- 3	263,208	3-28	[1]109,281	3-14	49,861	11-14	95,857	1- 3
1943	[1]4,436	11-13	4,331	12- 4	245,752	5-29	94,159	3-20	46,187	11-27	72,881	1- 2
1944	4,423	2-26	[1]4,453	1- 1	240,992	1- 1	87,287	3-25	42,310	1- 1	57,330	1- 1
Lows:												
1939	[2]1,601	8-26	3,125	2-18	[2]229,127	10-12	71,152	10- 7	20,722	4-15	105,397	4- 8
1941	3,364	1-11	3,490	1-18	240,399	11-15	79,923	10- 4	28,381	4-12	90,914	7-12
1942	3,297	7- 4	3,393	5-23	231,896	12-12	75,934	12- 5	29,240	4-25	72,962	12-26
1943	3,821	1- 9	3,579	3-13	232,191	1- 9	68,182	10-16	30,732	4- 3	57,596	12-25
1944	4,357	1- 1	4,228	2-12	236,119	3-25	76,302	1- 1	31,312	3-25	51,010	3-18

TRENDS OF 1943 AND 1944

Trends in Week Ended:	Crude Oil Production Daily	Runs to Stills Daily	Stocks Week End	Gasoline Production Weekly	Gasoline Stocks Week End	Gasoil and Distillate Production Weekly	Gasoil and Distillate Stocks Week End	Residual Fuel Production Weekly	Residual Fuel Stocks Week End
1943:									
January 2	3,871	3,734	233,938	10,957	82,420	4,285	42,913	7,683	72,881
January 30	3,826	3,698	233,863	10,339	88,830	3,888	37,057	7,452	70,763
February 27	3,873	3,709	235,217	10,566	93,157	4,230	32,939	7,839	70,140
March 27	3,896	3,742	239,126	10,231	94,079	3,541	30,980	8,018	67,938
April 24	3,913	3,737	242,035	10,583	91,001	3,954	31,142	8,168	67,455
May 29	3,970	3,679	245,752	10,656	83,937	3,798	32,274	7,672	67,682
June 26	3,955	4,015	242,657	11,092	79,589	3,876	34,044	8,126	67,960
July 31	4,133	3,788	238,420	11,127	74,977	3,765	36,363	8,478	66,877
August 28	4,196	4,227	236,170	12,420	72,525	4,351	37,928	8,732	67,250
September 25	3,344	4,156	233,013	12,206	70,024	4,608	40,328	8,560	66,659
October 30	4,383	4,176	237,219	12,813	69,297	4,642	44,591	7,968	63,833
November 27	4,414	4,261	239,761	12,638	69,980	4,379	46,187	8,633	62,143
December 25	4,363	4,185	241,310	12,597	74,024	4,457	43,791	8,689	57,596
1944:									
January 1	4,357	[1]4,453	240,992	13,192	76,302	4,575	42,310	9,141	57,330
January 29	4,409	4,359	240,251	13,427	81,085	4,054	37,266	8,889	52,857
February 5	4,400	4,324	239,145	13,192	81,784	4,138	36,023	9,087	52,734
February 26	4,423	4,377	237,137	13,183	85,248	4,558	33,766	8,952	51,387
March 4	4,413	4,344	237,763	13,267	86,091	4,513	33,145	8,590	51,175
March 11	4,381	4,387	236,748	13,068	86,559	4,243	32,705	8,796	51,362
March 18	4,385	4,437	236,119	13,393	86,185	4,596	31,808	9,293	51,010
March 25, 1944	**4,385**	**4,443**	.....	**13,168**	**87,287**	**5,034**	**31,312**	**9,013**	**51,576**
March 27, 1943	3,896	3,721	[4]238,417	10,198	94,511	3,675	31,675	7,857	68,039
Change:									
In week	.....	+6	−629	−225	+1,102	+438	−496	−280	+566
In year	+489	+722	−2,298	+2,970	−7,224	+1,359	−363	+1,156	−16,463
In year	+12.6%	+19.4%	−1.0%	+29.1%	−7.6%	+37.0%	−1.1%	+14.7%	−24.2%

[1] All time peak. [2] Lowest since April, 1922. [3] Lowest since October, 1922, due to shutdown of six Mid-Continent States. [4] Stocks, March 20, 1943.

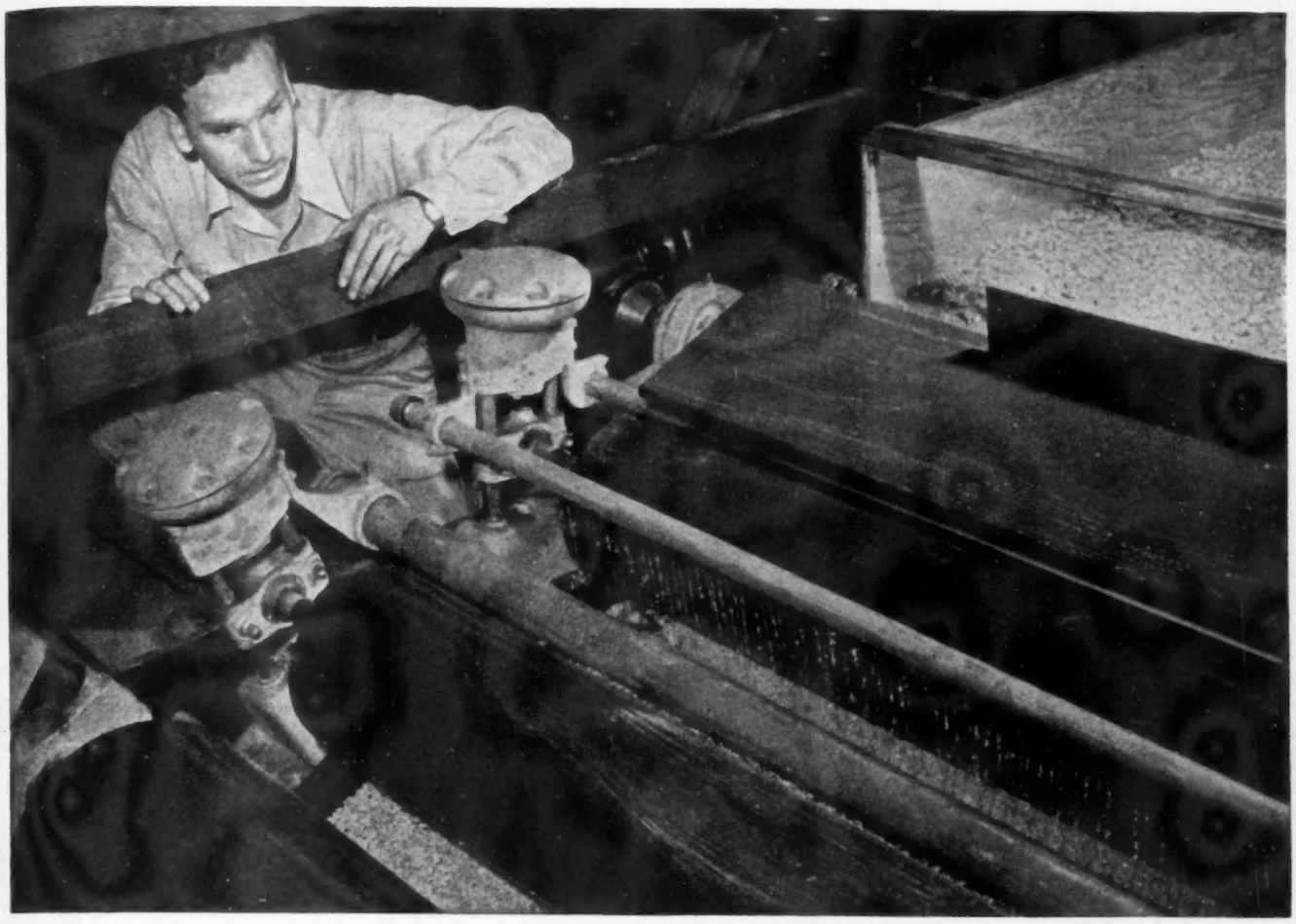


Photo U. S. Rubber Co.

Synthetic rubber crumbs being washed, at the $56,000,000 plant at Institute, W. Va., operated for the Government by U. S. Rubber Co. and Carbide and Chemicals Corp.

Drawing a BIG, NEW INDUSTRY *out of a* HAT

Anywhere else in the world, the idea would have been rejected as fantastic. It was proposed, in wartime, to produce a big new industry, practically out of a hat! Yet American resourcefulness and skill did the job—built a synthetic rubber industry to make the nation self-sufficient (if it wishes) in this vital commodity.

SPECIAL STEEL FASTENINGS NEEDED—Synthetic rubber plants, in which liquids and gases circulate in an intricate system, often under high temperatures and pressures, demand special steel fastenings in great quantity. A pioneer in the development of steels for high-temperature service, Bethlehem had a large share in meeting this demand, as the rubber program went into high gear.

Bethlehem's Bolt and Nut plant, already hard at work, swung into still higher production. Not only synthetic rubber plants, but the related high-octane gasoline program—and the shipbuilding program, too—needed many fastenings of specialized types, where standard fastenings could not possibly be used. More machines were put to work. More men and women workers were hired and trained. Between January, 1943, and the following July Bethlehem's production of carbon and alloy heat-treated studs was more than doubled. And the increase in production of Bethlehem-treated, oil-quenched nuts was almost as great.

With the rubber program accomplished, Bethlehem is now better able to fill other essential needs for high-temperature, high-pressure fastenings. Tell us about your problem. We'll help you if we can. Get in touch with the nearest Bethlehem representative, or write direct to Bethlehem Steel Company, Bethlehem, Pa.

★ ★ BETHLEHEM STEEL ★ ★

age and a normal seasonal withdrawal of heating oil from storage, while a considerable volume of residual fuel was added to badly depleted stocks.

Gasoline statistics of the week reflected the earlier temporary artificial demand caused by change-over to lower coupon values outside the East Coast district, many motorists apparently having previously used all available coupons while still good for the larger amounts. Thus in the week of March 25, national inventories were increased 1,102,000 barrels in spite of a cut-back in production of 225,000 barrels for the 7 days as compared with the previous week, to a weekly total of 13,168,000 barrels, equivalent to 1,881,000 daily. Despite that reduction, however, production was 424,000 barrels a day or 29.1 percent greater than in the corresponding week a year ago. And the accumulation of gasoline in storage still left inventories materially lower than a year previously. The 87,287,000 barrels on hand March 25 was 7,224,000 barrels or 7.6 percent less than the 94,511,000 barrels held on March 27 last year.

Production of gasoil and distillate fuel totaled 5,034,000 barrels in the week of March 25, an average of 719,000 daily. This was more than in the previous week and about 37 percent more than in the corresponding week a year ago. Stocks were reduced in about the same amount as the cut-back in production, but in standing at 31,312,000 barrels March 25 they were at practically the same level as on the corresponding date last year.

Residual fuel oil production of 9,013,000 barrels in the week of March 25 was an average of 1,288,000 daily, which was 40,000 barrels a day or 14.7 percent more than production in the like week last year. Stocks were increased, despite the production curtailment, by 566,000 barrels during the week, an average of 81,000 barrels daily. They then stood at 51,576,000 barrels, and were 16,463,000 barrels or 24.2 percent under the level of 68,039,000 barrels at which they were on March 27 last year.

Crude stocks were reduced 629,000 barrels in the week ended March 18, an average of 90,000 barrels daily, the Bureau of Mines reported, and standing then at 236,119,000 barrels, they were about 2,000,000 barrels or 1 percent lower than a year previously.

MACKLIN

MACKLIN HIGH QUALITY WHEELS
FOR EVERY GRINDING PURPOSE WILL
"PROTECT YOUR PRODUCTION"

Ask for the services of a Macklin Field Engineer

This FREE 64-page book still available. Write for your copies.

MACKLIN COMPANY

Manufacturers of GRINDING WHEELS — JACKSON, MICHIGAN, U. S. A.
Distributors in All Principal Cities

Sales Offices:
Chicago - New York - Detroit - Pittsburgh - Cleveland - Cincinnati - Milwaukee - Philadelphia

Refinery Completed In Arctic Russia

London sources report that the Russian government has completed construction of a petroleum refinery at Ust-Ukhta, on the Izhma River, and that the new plant has a capacity of more than 30 million barrels per year. It has also been confirmed that a new railroad line, 1100 miles in length, has been completed and put into service across this far northern region, with its terminal at Khabarova, at the tip of the Paikhoi Peninsula, most northern point in European Russia. This new line provides an outlet for mineral deposits being opened in the northern Urals and coal and oil resources known to be present in the Pechora basin, which lies between the Urals and the Timan Mountains. Erection of the reported new refinery, together with the reported development of new oil fields in the Izhma Valley during the past year, indicate that major operations are in progress in Komi province.

Gulf of Paria to Be Explored by British

Representatives of governments of Great Britian and Venezuela have concluded an agreement for exploration and development of possible oil deposits lying below the waters of the Gulf of Paria, between the Venezuelan mainland and the island of Trinidad, marine territory long regarded as favorable. Under terms of the agreement, permanent division of mineral rights has been established. A northeast-southwest line has been set as the political-commercial boundary between the two land areas. The line intersects Patos Island on the northeast, and Soldado Rock on the southwest. The agreement was announced by McColl-Frontenac Oil Company of Canada, parent company of Antilles Petroleum Company, which operates in Trinidad.

Drilling Contract Let for Nova Scotia Wells

Lion Oil Refining Company awarded a contract to Delta Drilling Company, Tyler, Texas, for drilling to be started in April in the Mabou area of Cape Breton, in Nova Scotia. Three locations have been made for exploratory tests. The company has exploration rights on 900 square miles of territory in the province.

U. S. Field Operations

Illinois Basin

Pure Opens Good Well In North Schnell Pool

Pure Oil Company has extended the Mt. Erie pool, Wayne County, Illinois, ½ mile southwest with McClosky lime production at Wilson 1, NE NW 10-1s-8e. Pay was found at 3217-24 feet, where 5½-inch pipe was set. Total depth is 3235 feet.

Montgomery County: The Texas Company's Marine Bank 1, NE NE SE 32-10n-3w, held possibilities as a small pool opener after shows of oil and no water were found in a drill-stem test of Devonian lime topped at 1991 feet. It was coring at 2066 feet.

Wayne County: In the Mayberry pool south of Wayne City, The Texas Compan was moving in standard tools to drill plug for a test of oil in the Warsaw formation at 4263 feet at Draper 1, N ½ SW SW 8-3s-6e. Drilled through a dr Devonian lime, hole was plugged back from 5380 feet.

Clay County: Pure Oil Company's Hawkins A 1, W½ NW NE 25-3n-8e, North Schnell pool, flowed 1035 barrels of oil and no water from McClosky lime after 5000 gallons of acid. Total depth was 3000 feet. The company's Wright Consolidated 1, W½ NW NE 30-3n-9e, flowed 498 barrels of oil and no water after 5000 gallons of acid. Total depth of hole is 3015 feet, in McClosky lime.

Douglas County: A proposed test in wildcat territory by Ohio Oil Company is holding much interest in the Illinois basin. The company has taken leases on 10,000 acres in Douglas County near the town of Tuscola along the LaSalle anticline, one of the state's major oil structures, and intends to drill a test to 6000 feet. A well drilled to such a depth, according to Dr. M. M. Leighton, chief of the Illinois State Geological Survey, would reach older and deeper formations than have ever been tested before in the Illinois basin. The company expects to acquire approximately 2000 more acres in the block before a location is made. Drilling will get underway when weather conditions are favorable.

Shelby County: The Texas Company's Noffke 1, SE SE NW 31-11n-6e, near Strasburg in wildcat territory, has been abandoned at 2182 feet.

Hamilton County: Gulf Refining Company's Manford-McGrath 1, NE NE SE 14-4s-5e, a wildcat test 3 miles southwest of the Dahlgren field, has been abandoned at 3515 feet.

Kentucky

Ashland Refining Company and Basin Drilling Company have extended production in the Uniontown pool of Union County, Kentucky, ½ mile south at Nolan Alvy Community 1, 21-P-19, with yield from the Cypress sand. After swabbing 416 barrels of oil in 15 hours, the well started flowing eight barrels of oil per hour while the operators attempted to run tubing and rods. Cypress was topped at 2275 feet with total depth 2285 feet. One location south of the extension well, the same operators' Nolan Alvy Community 2, was preparing to test in Waltersburg sand at 1780-92 feet.

Indiana

Frontier Fuel Oil Company has a prospective pool opener at Hill 1, SE SE SW 18-7s-12w, in Posey County, Indiana. After favorable results during a drill-stem test of Tar Springs sand at 1931-51 feet, the operators set pipe and is now waiting on cement. Total depth of the hole is 2776 feet.

Ashland Refining Company and Ledbetter's Mann 1, NE NE NW 5-7s-14w, which extended the Upton pool ¼ mile south and also added a new producing horizon has been completed on pump for 48 barrels of oil in 24 hours. Production is from Waltersburg sand at 2122-37 feet. The well was given a 10-quart shot. Production in the pool proper is from Tar Springs and Aux Vases.

Kansas

Important Discoveries In Stafford County

Stafford County claimed the spotlight in Kansas oil operations last week reporting two important discoveries. An extension to an old pool and discovery of shallow pay in an established field also claimed interest.

A mile and one half northwest of Mueller field, Stafford County, Stanolind Oil & Gas Company completed Syms 1, C S NW NE 20-21s-12w, which flowed 192 barrels per day with no water from 13 feet of Arbuckle pay. The producing horizon at 3581-3594 feet, total depth, was acidized with 3500 gallons. Oil string was set at 3581 feet.

Atlantic Refining Company's McCandless 1, SW SW SE 30-25s-13w, testing for a couple of weeks, reported swabbing 10 barrels of oil per hour after perforating Simpson with 58 shots at 4251-67 feet. Simpson was topped at 4255 feet; Arbuckle logged at 4289-4319 feet with pipe set at 4303 feet. Initial perforations were made at 4284-95 feet with no shows and the well was drilled deeper to 4323 feet where no shows were encountered, then pluggged back to 4251 feet, deepened 16 feet and acidized with 500 gallons. Testing continues.

Russell County: A new Pennsylvanian horizon for the Janne pool which produces from Ordovician has been established with completion of Lauck-Moncrief's Janne 1, SW SW NE 24-15s-12w, flowing 624 barrels of oil in the first 24 hours after being acidized through perforations in Lansing at 3070-84 feet, total depth.

Graham County: Frank Buttram and W. C. Kite extended the Morrell pool a quarter mile southwest completing Balthazar 1, NW SE 23-9s-21w, with a potential of 3000 barrels per day. Production is from the Arbuckle at 3792-97 feet, total depth.

Barton County: Another pool on Boyd Hill has been opened as Republic Natural Gas Company's Logan 1, NEc 9-18s-14w was completed flowing 400 barrels oil daily after being plugged back from 3412 feet. Casing was perforated at 3333-80 feet. A mile west of the discovery, Royer-Farris et al have derrick up for Murdy 1, CE NE NE 8-18s-14w.

Sheridan County: Thirteen miles north of the Studley pool, Continental Oil Company bottomed Cramer 1, NWc NE 11-6s-27w, in granite at 4047 feet after testing Arbuckle with no shows. The well probably will be plugged back for a test of the Lansing. Tops were not disclosed.

Oklahoma

Weather Handicaps Tests Of Two Deep Wildcats

Sleet and rain in North Oklahoma last week stopped field operations in a number of locations and hampered tests in the state's two deepest wildcat tests in McClain County on the eastern rim of the Anadarko Basin.

Carter Oil Company's Johnson Ranch 1, C SW NE 13-8n-4w, after recovering salt water in a test of Second Wilcox topped at 10,462 feet, plugged back and perforated Hunton where oil stains and odor were reported in a core at 9490-95 feet. Testing tool was opened two hours with no shows after which swab was run and fluid level was topped at 7000 feet. Swabbing was discontinued when water lines around the well froze as a result of the spring blizzard.

Carter Oil Company's Cottingham 1, C SE SW 4-7n-3w, which at first flowed 6 barrels of oil per hour from perforations in Second Wilcox at 10,625-40 feet to assure a discovery, re-perforated at 10,640-50 feet, and also has been delayed by frozen lines. The test may increase the oil flow as cores of this 10-foot section were richer than the section above. Observers believe the well will be completed for 400 barrels per day, marking the first important strike in the deep Wilcox of the Anadarko Basin. Hole was drilled to 11,209 feet and pipe is set at 10,781 feet. Testing March 31, it flowed 30 barrels of oil, 1 salt water per hour from perforations at 10,640-50 feet in Second Wilcox.

Osage County: A new producing zone for the East Naval Reserve area has been opened by W. M. Dunn et al's Lohah 3, SWc NE 18-24n-8e, which flowed 260 barrels of 41-gravity oil on a 24-hour test from Arbuckle lime topped at 2840 feet and penetrated only 6 inches. The discovery is a location southwest of Lohah 2, near center of the northeast quarter of the section, finaled in Hominy-Wilcox three years ago.

Garvin County: Ohio Oil Company's Brundige 1, NW SE NE 17-3n-2e, apparently extended the East Paul's Valley gas field ½ mile northeast after recovering gas on a drill-stem test at 3043-3155 feet. Slight gas show was also reported at 2950-3042 feet.

Hughes County: Creekmoore-Rooney's Dannenberg 1, C NE NW 35-9n-10e, an old well deepened, flowed 816 barrels of 38.5-gravity oil from the Cromwell sand at 3168-72 feet. The wildcat is ½ mile southeast of Wetumba on the edge of the Wetumba gas field which produces from the Gil-

crease. The new discovery presages an immediate drilling campaign for the area.

Caddo County: Cement continues interesting with two outposts to the southeast drilling for the deep Marchand sand. Ohio Oil Company's Pau-Kune 20, SW SE SW 3-5n-9w is below 3800 feet and Hemphill 1, NE NW SW 18-5n-8w is at 1075 feet.

Jefferson County: Ohio Oil Company's Ash 1, SW SW NW 17-5s-7w, 15 miles south of the Comanche pool, abandoned at 3581 feet after testing Arbuckle at 3250 feet.

South Dakota

Nine Tests Seen for South Dakota in 1944

Quest for oil in South Dakota, started on a big scale three years ago, will be continued in 1944 with at least nine test wells.

First of these is expected to be spudded in SE SE 32-15n-2e, near Gustave in Harding County, by the Kerr-Lynn Company. A unit agreement combines the interests of Carter Oil Company, Northern Ordnance, Inc., A. I. Levorsen, Elma H. Levorsen, Fred G. Moser, Ada I. Moser, Norval Ballard, Everett Carr and J. J. Deaner.

Northern Ordnance has been designated the unit operator and will direct the drilling operations. The contract calls for a test to 8000 feet.

This year's prospecting activity, spurred by the wartime demand for oil, is a big increase over 1943 when drilling was limited to two major tests. An 8000-foot hole, drilled by Northern Ordnance under a farm-out agreement with Carter Oil Company, SW SW 1-17n-1e, section 1, township 17 north, range 1 east, in Harding County, was dry. Another drilled by A. S. Woodward Company, a half mile north of Ardmore in Fall River County, SW SW 4-14s-4e, is producing gas to be sold to consumers in Ardmore. The company has announced plans for additional wells in the immediate vicinity.

The 8000-foot Northern Ordnance well, drilled last year, was the deepest in South Dakota. A 7980-foot well drilled in the same vicinity by Carter Oil Company in 1940 found small shows of oil in the limestone formation and a considerable show in the Deadwood sandstone.

Interest in western South Dakota was stimulated by a successful well in the Newcastle, Wyoming, area, a few miles from the South Dakota line, brought in by Western Oil & Gas Trust at 3852 feet, and expected to produce 1000 barrels daily. Four more tests are being planned in the Newcastle vicinity.

Regulations to govern production of oil and gas in South Dakota were adopted during the winter by the newly created state oil and gas board, modeled after conservation regulations in other states. A 10-acre spacing pattern has been established. Federal regulations require 40-acre spacing but the South Dakota board believes the federal regulations may be modified as more steel and tools become available.

New leasing terms have been established by the South Dakota rural credit board. New leases will charge 10 cents an acre for the first five years and 25 cents an acre for the next five years.

California

Buena Vista Field Has Great Prospects for Year

Within a week after discovery of a new zone in Buena Vista field, Kern County, starts were made on six wells in adjacent territory. Numerous others are in contemplation, and it now is evident that if it proves to have the area extent indicated, the field will be the scene of the greatest development activity in the state before the end of the year. Most geological opinion inclines to the probability that the zone will be found present over a wide area, possibly as much as 5000 acres. Engineers estimate that with only ten strings of tools, new productive capacity could be increased several thousand barrels a day every 30 days.

Superior Oil Company has a prospective discovery in an area a few miles southeast of Greeley field. On a formation test near the 6600-foot level, the well blew gas and oil up to the crown block. Data is being withheld.

Kern County: Standard Oil Company is well under way with its much-discussed deep test of the Thirty-five Anticline area, Midway-Maricopa field, originally announced to go to 15,000 feet. It now is reported the company may attempt a record for deep drilling in this well, with even a 17,000-foot mark a possibility.

Los Angeles County: It is now generally believed that despite difficulties that have delayed the production test, Pauley Bros.' wildcat between Playa Del Ray and El Segundo has opened a new field. Information as to test results has not been given out, but some reports say the well is capable of 200 to 300 barrels a day.

West Texas

Devonian Production Is Found in Permian Basin

First oil production from the Devonian in the Permian Basin has been assured by The Texas Company's Hobbs-Shell 1, C N¼ of N¼ H&TC 46, Block 35, southeastern Crane County, and it was coring at 5395 feet to explore the Ordovician series before landing pipe for completion. This wildcat logged the Permian-Devonian contact at 5260 feet with elevation of 2374 feet, and drill-stem test at 5240-95 feet yielded gas at rate of 500,000 daily, and 1530 feet of 45-gravity oil was recovered from drill pipe. Additional pay was logged in coring to 5355 feet, where tester recovered 120 feet of oil and 60 feet of drilling mud and water with good gas blow. This wildcat is 6½ miles northeast of Skelly Oil Company's Richardson 1, Ellenburger failure that showed some oil in Ordovician, and the nearest deep test. It is 8½ miles southwest of a small Silurian oil producer in the McCamey field.

Gulf Oil Corporation's Waddell et al 43-0, NW SE PSL 20, Block B-26, marks the opening of an Ellenburger area in the northeast portion of the Sand Hills field's Clear Fork production, having yielded 300 feet of oil and 350 feet of oil-cut mud with good show of gas when tester was used at 5796-5840 feet. It is 4 miles northeast of the nearest Ellenburger production, and 4 miles northeast of a small well in Simpson. Sand Hills structure has 2 Ellenburger producing areas. Magnolia Petroleum Company's Lea 10, south offset to a prolific McKnight lime producer in the northeast portion of Sand Hills field, was to perforate at 3225-36 feet and test after yielding gas from perforations at 3125-40 and 3160-80 feet.

Pecos County: Phillips Petroleum Company's Price 1, 19 miles southwest of Taylor-Link field, nearest production, equalled the world's depth record of 15,004 feet on March 27 and temporarily halted for rig repairs at 15,017 feet in Simpson sandy-shale. It is due to continue to Ellenburger.

Crockett County: Amerada Petroleum Corporation's Todd 3-A, ¼-mile east outpost for the Todd field, entered Crinoidal at 5728 feet, 73 feet high, with top of pay at 5733 feet, and was drilling at 6110 feet in Simpson, topped at 5978 feet. It will be carried to Ellenburger before attempting completion in the 250-foot Crinoidal section. More than half dozen wells are due to be drilled this year on the northeast side of the structure.

Winkler County: Stanolind Oil & Gas Company and Shell Oil Company's Wheeler 1-A, ½-mile west of the Wheeler-Ellenburger discovery, flowed 49 barrels of oil in 12 hours through varied chokes from perforations at 10,642-10,661 feet. This test entered Ellenburger at 10,642 feet, 162 feet low, and reached water at 10,680 feet.

Andrews County: The Texas Company's Mabee 8, C NW SE T&P 38, Block 40, extended the Mabee field more than a mile north, establishing an upper pay and the highest structural position. This development adds 3 or more sections of prospective oil-producing acreage. Mabee 8 yielded 115 barrels of fluid, with rotary fluid decreasing to 7 percent, on 3-hour swabbing test at 4657 feet, and will be deepened to the San Andres pay. Seven-inch is cemented near top of Grayburg saturation at 4562 feet with elevation of 2916 feet. The company's Mabee 7, ¾-mile east of the most southerly producer, pumped 209 barrels of 31-gravity oil on 23-hour test after 380-quart nitro shot at 4647-4715 feet, elevation 2905 feet.

The Texas Company's Pattillos 1, recent strike near the southeast edge of Shafter Lake, has been flowing occasional heads of oil from Grayburg-San Andres contact while setting up machine to cleanout cavings after a 420-quart nitro shot at 4280-4380 feet with hole bottomed at 4414 feet. Cities Service Oil Company is starting a Clear Fork test on short-term University acreage west of this discovery.

Stanolind Oil & Gas Company and The Texas Company's Logsdon 1, northwest extension for Fullerton field and possibly the connecting link for the Union field, unloaded itself at 7012 feet for flow of 1087 barrels of oil, gas-oil ratio 1036/1, through casing in 22½ hours. This outpost was drilling at 7130 feet to take in the entire Clear Fork pay zone. Magnolia Petroleum Company's Bitler-Lowe 1-A, ½-mile northeast extension for the Fullerton field, flowed 71 barrels oil on 4-hour test after using 2000 gallons of acid at 6935-7025 feet with elevation of 3333 feet, and will re-acidize. Development of this sweet oil area is being expanded as rigs become available, and no failures have been drilled.

North Texas

Southwest Clay County Pool Opened in Bend

Southwestern Clay County scored a new pool when Wilcox Oil & Gas Company and Continental Oil Company's Scaling 1, J. Gamble Survey, swabbed 115 barrels of oil on preliminary test from perforations at 5554-70 feet in Bend, topped at 5355 feet. This wildcat is 3½ miles northeast of the Watson pool, which also produces from the lower section of the Bend. Scaling 1 was carried to Ellenburger at 6160 feet. It is expected to make a flowing well when acidized.

Archer County: George W. Cooper et al's Parkey-Fain 1, east offset to their recent 4300-foot Strawn oil discovery in the Cooper-Parkey pool, established a shallow pay in flowing 300 barrels of oil through casing in 4 hours after 100-quart nitro shot at 3902-39 feet, having plugged back from 4347 feet.

Jack County: Standard Oil Company of Texas and Hanlon-Buchanan's Moore 2, west offset to the partnership's Strawn sand discovery on the north edge of the Ellis pool, is showing for an equally as good well in Strawn saturation topped at 3593-3601 feet. Drill-stem test yielded 11 stands of highly oil- and gas-cut mud in 30 minutes and pipe was run to complete.

East Texas

Wood County Deep Well Reports Good Production

Gulf Oil Corporation's Brewer 1, Ben Lee Survey and 2⅓ miles southwest of Winnsboro, established a new high-gravity field and the first production below Paluxy in Wood County in flowing 231 barrels of 42.3-gravity oil natural with gas-oil ratio of 1095/1 through double chokes consisting of ⅛- and 5/32-inch. Production is from Upper Rodessa perforations at 7990-8014 feet. This wildcat flowed 5 barrels hourly with diminishing gas output after acidizing through perforations at 8253-88 feet, but this lower pay has been sealed off. Brewer 1 was drilled to 8719 feet, having entered Travis Peak at 8700 feet with elevation of 479 feet. The company has moved rig to the northwest to drill Willie Hornbuckle 1 in northwest corner of 62.99-acre lease, Lee Survey. Gulf Refining Company's pipe line is a short distance east.

The Winnsboro discovery is on a geological strike with the Quitman, Manziel and New Hope areas. The latter produces from Rodessa, Pettit and Travis Peak. Quitman has not been explored for any of these horzions, while the first deep test at Manziel is showing for a small well from Rodessa. Amerada Petroleum Corporation's Sheppard 1, Paluxy prospect between the Manziel and Quitman fields, was drilling at 4385 feet, having entered Pecan and Austin at 2570 and 4000 feet, respectively, with elevation of 404 feet. All available acreage between the inactive Oak Grove discovery in the Woodbine to the southeast of Quitman has been leased at steep prices, with Shell Oil Company setting the pace. A Paluxy test is slated to be drilled by

★ AVOID USELESS WRAPPINGS! ★ ACCEPT SIMPLER PACKAGING! ★
PAPER
PACKS A WAR
PUNCH!
FIGHT WASTE!
★ SHARE THE PRINTED WORD! ★ MAKE EACH PIECE STRETCH! ★

Illinois interests 1½ miles southeast of the Quitman townsite, but the new lease play does not extend south or west of this drilling block.

Limestone County: Zephyr Oil Company's Nussbaum-Scharff 1, 3 miles northwest of Groesbeck and adjacent to old shallow gassers, flowed 3 to 5 barrels of fluid hourly, averaging 50 percent 42-gravity oil and balance salt water, for a short period after acidizing through perforations at 4742-4800 feet. Later swabbing test increased the percentage of water. Production is from Upper Glen Rose, topped at 4010 feet with elevation of 496 feet, and has not heretofore accounted for oil or gas in commercial quantities. This prospect was drilled to 5515 feet, having entered Pettit at 5415 feet.

Smith County: Phillips Petroleum Company's McMinn 1, M. M. Long Survey, 6 miles southwest of Tyler, landed 5½-inch on bottom at 10,011 feet, and will try for completion through perforations in promising gas-distillate shows in the Rodessa series. Geological markers have not been made public, although considerable royalty has been purchased by those having access to the information. In the Sand Flat field, Arkansas Fuel Oil Company's Marsh 1, 2400 feet southeast of the Paluxy flowing discovery, swabbed 10 barrels of 21-gravity oil hourly on extended test from perforations at 7080-7118 feet, then flowed small heads of oil daily. Sun Oil Company's Patterson 1, west outpost, failed to overcome salt water handicap in showing live oil from Rodessa perforations at 9349-58 feet, then tested water without oil or gas from perforations at 9332-42 feet.

Camp County: Mid-Continent Petroleum Corporation's McGahee 1, 3 miles northwest of Pittsburg, entered massive anhydrite at 7183 feet, and coring was at 7380 feet. Tide Water-Seaboard Oil Company's Roberts 1 was drilling sandy-shale at 8140 feet, with noticeable thickening of zones below the massive anhydrite.

Delivery of Tractors Eases Tank Truck Status

The tank truck situation in all sections of the country has been appreciably eased by the priorities granted in February by the War Production Board for the delivery of tank truck tractors, according to the Office of Defense Transportation.

At the request of ODT, 648 applications were handled in February, 512 of them being placed on a priority basis ahead of all other civilian trucks.

Entire Family in Oil Business

The Johnston brothers, six of them, represent an entire family in the oil business. The father, R. C. Johnston, Sr., who died recently, was a retired drilling contractor, as was a seventh brother, J. T. Johnston, also deceased.

R. C., Sr., was 84 years old when he died and had served the industry since the days of Spindle Top. His seven sons started in the field as roughnecks. They all became drillers and subsequently drilling contractors operating their own businesses.

J. T. died about 10 years ago, in Beaumont, Texas, after having organized the Arkansas Drilling Company which had an important part in development of the El Dorado, Arkansas, field.

The remaining six Johnstons are shown above, left to right: Blaine, technical adviser, Johnston Oilfield Service Corporation, Houston; E. L., drilling and production superintendent, Delta Drilling Company in Indiana, Illinois and Kentucky, headquartered at Evansville, Indiana; M. O., head of M. O. Johnston Oilfield Service Corporation, Los Angeles; R. C., vice president in charge of drilling and production for Delta Drilling Company, Tyler, Texas; J. L., superintendent for E. C. Johnston Interests, Longview; and E. C., who owns his own drilling and producing properties, with headquarters at Longview.

Southwest Texas

New Trend Possible in Saxet Area, Nueces County

The old Saxet field of Nueces County held the spotlight of interest this week when an important new deep pay discovery was indicated in Chicago Corporation's Weil 1. The well flowed 5 barrels of fluid per hour on a 5/32-inch choke while cleaning, 40 percent, 38.6-gravity oil, and 60 percent fresh water. Casing pressure was 2180 pounds, with perforation at 10,193-216 feet, total depth 10,520 feet, with casing set to 10,306 feet for completion. The test is in the north end of Tract 1, McBryde Partition, E. Villareal grant. If it turns out to be a commercial producer, it will open new trend of extra-deep development in the area.

Texon Royalty Company is preparing to resume drilling in Kocurek 10, which was temporarily abandoned in November, 1941, at 7500 feet. Originally planned as a 10,500-foot project, operators have decided to carry the hole on down. It is on the south flank, near Clarkwood.

Goliad County: Continental Oil Company is retesting Heard 1, a promising wildcat about 10 miles north of Goliad, in the Robert Walker survey. The well tested oil after acidizing perforations at 8910-16 feet. Prior to acidization, a drill-stem test had recovered a 3000-foot water cushion plus 7½ stands of oil and oil-cut mud. Total depth is 9003 feet, with 6-inch casing set to 8992 feet for completion.

Brooks County: Humble Oil & Refining Company has established a new pay for the Scott & Hooper field, in rework of Scott & Hooper 1, the discovery well. After being completed in perforations at 6878-87 feet, the well was plugged back and reperforated at 6536-53 feet, and made 230 barrels per day on 3/16-inch choke, 43-gravity oil, no water, gas-oil ratio of 885-1, tubing pressure 840 pounds, with casing sealed.

San Patricio County: A final gauge on Humble Oil & Refining Company's Green 1, discovery well of the Gregory field, showed 270 barrels of 55.6-gravity condensate, no water, with 1,660,500 feet of gas, gas-oil ratio 6150-1, tubing pressure 2310 pounds, from perforations at 9120-40 feet. Derrick is being built for Green 2, ½ mile northeast of the discovery.

DeWitt County: New discovery in the top of the Wilcox, Arkansas Gas and Fuel Company's Buehrig 1, 3 miles northwest of Myersville, flowed gas and a spray of condensate on a drill-stem test through perforations at 7580-87 feet. Total depth is 9010 feet.

Jackson County: Seaport Oil Company's Bennett 2, was testing a new sand at 6078-92 feet, with indications for possible production. The well is 1½ miles west of Vanderbilt, and 1015 feet northwest of the discovery well of the LaSalle field.

Willacy County: Sun Oil Company's Cavazoe 1, a southeast extension to the Willamar field, tested 151 barrels of oil on 3/16-inch choke, with gas-oil ratio 560-1, tubing pressure 200 pounds, casing pressure 1200 pounds from perforations at 7932-39 feet.

Jim Hogg County: The Texas Company's East 1-B, a south extension of the Neuhaus field, was being put on the pump after swabbing oil from open hole at 3455-62 feet. Neuhaus pay was logged at 3455-60 feet, and 90 feet of oil-cut mud was recovered.

McMullen County: Edwin M. Jones' Ezzell 104, southwest of the southwest end of the Ezell field, pumped 64 barrels of oil and 4 barrels of water the first 24 hours after additional perforations at 1206-12 feet in the Hockley sand. Total depth is 1790 feet.

Texas Gulf Coast

New Productive Area Seen For Jefferson County

A new productive area is indicated by Sun Oil Company's Florence Wingate 1 which is flowing about half oil and half water through ¼-inch choke, from perforations at 8658-77 feet. The well is 3½ miles southeast of Fannette Townsite in Jefferson County, in the David Burrell survey. Tubing pressure is 800 pounds, casing pressure 600 pounds, and total depth is 9905 feet.

The Cottonwood district, Liberty County, has a second small producer, in William Helis' Willis 1, easterly southeast offset to the discovery, which flowed approximately 42 barrels on a ¼-inch choke, from perforations at 7747-57 feet. Gas-oil ratio was 139-1, gravity 25.8, with .2 percent water on official potential.

In Hardin County, American Repub-

SPERRY-SUN

COMPLETE INFORMATION

regarding Sperry-Sun Well Surveying instruments and technical services is given in our latest catalog. If you have not yet received a copy of this catalog, fill out the form below and we will gladly mail it to you.

Kindly mail me a copy of your latest catalog

To: SPERRY-SUN WELL SURVEYING CO.,
1608 Walnut St., Phila. 2, Pa.

Name_____

Position_____

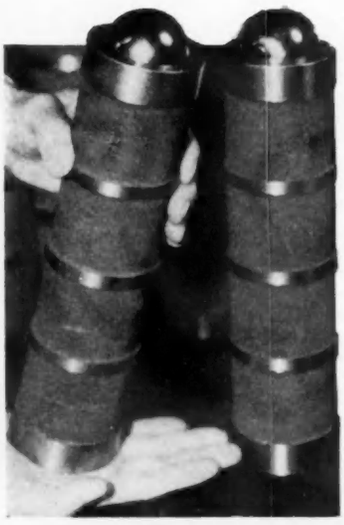
Company_____

Address_____

O.W.

SPERRY-SUN WELL SURVEYING CO.
PHILADELPHIA, PA.
HOUSTON, TEXAS LONG BEACH, CALIF.

AXELSON LINERS
STAND THE *THIN AIR* TEST



Seal the bottom of an Axelson Liner with your hand, or place it upright on a rubber mat, and a steel ball of proper size will be supported by the pressure of air trapped within the liner. Place any number of liners on top of the first and still the ball will not drop through . . . so perfectly are the faces and the inside of each liner finished. This simple but spectacular demonstration is convincing proof of the accuracy with which Axelson pumping equipment is made . . . to guarantee the efficiency of your production operation.

Axelson Manufacturing Co.
6160 S. Boyle Ave., Box 98, Vernon Station, Los Angeles 11, Calif.
50 Church St., New York City 7.
204 Munsey Bldg., Washington 4, D.C.
3844 Walsh St., St. Louis 16, Mo.
1503 Nat'l Bank of Tulsa Bldg., Tulsa, Okla.

AXELSON MANUFACTURES AND SERVICES
DEEP WELL PLUNGER PUMPS & SUCKER RODS

WHY IS A DRILLING RIG LIKE A LIBERTY SHIP?

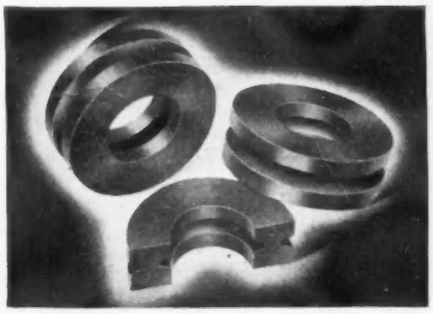
After starting on a voyage, neither a ship at sea nor a rotary drill on the way to its deep-in-the-earth destination can afford to stop for repairs. Power must not be lost, pressures must be held, shafts kept turning.

U.S. Packings help to do these things—help keep equipment working smoothly over long periods of sustained operations. U.S. Packings are dependable under all recommended operating conditions.

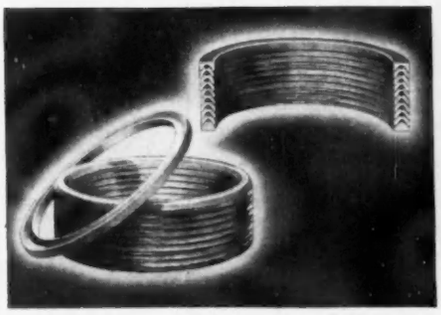
Another time and labor saving feature of U.S. Packings is the packaging and labelling of sets for all oil field equipment. Each packaged set is sold with an identifying label that clearly states names and sizes of equipment for which the set is designed.

To get the right set at your supply store, all you need is the name and size of your equipment.

SERVING THROUGH SCIENCE



SPECIALLY DESIGNED U. S. Perfected Oil Field Stuffing Box Rings of exclusive design are staff engineered to provide *superior* service and expertly compounded to give *long* service.



AUTOMATIC IN ACTION—U.S. Matchless Packing sets for swivels reduce friction to the minimum. Molded to accurate size, sets have special top and bottom rings for square or bevel seatings.

THE LABELLED LINE—Shaft diameters... stuffing box depths have been checked in advance by U.S. Engineers. The label clearly identifies the packing set for your individual job.

Listen to the Philharmonic-Symphony program over the CBS network Sunday afternoon, 3:00 to 4:30 E.W.T. Carl Van Doren and a guest star present an interlude of historical significance.

UNITED STATES RUBBER COMPANY

1230 SIXTH AVENUE, ROCKEFELLER CENTER, NEW YORK 20, N. Y. • *In Canada:* DOMINION RUBBER CO., LTD.

lics Corporation-Houston Oil Company's Sternenberg 1, eight miles from Village Mills, H&TC 195, reported showings on a drill-stem test in perforations at 6226-45 feet. Bottom of the hole is at 6502 feet.

Colorado County: Cities Service Oil Company and Jack Frazier et al's Gay 1, James Tumlison survey, northwest of Columbus, has finally been completed as a dual well, with total depth at 8037 feet. The lower perforations at 7667-70 feet showed 560,000 feet of gas with 35.4 barrels of 44-gravity oil, on ⅛-inch choke, tubing pressure 1800 pounds, gas-oil ratio 15,700-1; upper perforation showed 7,590,000 feet of gas on 28/64-inch choke, with 156 barrels of condensate, flowing pressure 2275 pounds, shut-in pressure 2465 pounds, gas-oil ratio 47,000-1, at 7302-14 feet.

Chambers County: P. E. Daugherty "Pool," prospective discovery well in the "North Winnie" area, on lots 15-16, F. Valmore survey, about 3½ miles from Winnie townsite, has been killed for reworking. At the first test in perforations at 8752-55 feet, the well flowed 112 barrels of oil and 66 barrels of water on 10/64-inch choke, tubing pressure 1800 pounds. Total depth is 9519 feet, with 5½-inch set on bottom.

Harris County: On the south flank of the Dyersdale field, Cockburn Oil Company is providing storage for final completion of Detering 2, Eli Noland survey. Total depth is 4071, with 5½-inch casing set at 4051 feet. Screen has been set for an open-hole completion.

San Jacinto County: Stanolind Oil & Gas Company has spudded a 10,000-foot Wilcox test, Thomas S. Falvey 1, in the J. Fernandez de Rumayer Survey, 6 miles southeast of Shepherd townsite.

Waller County: On the south edge of the Katy field, Stanolind Oil & Gas Company is testing A. L. Short 1, in perforations at 7187-7209. Total depth is 7300 feet, with 7-inch casing set for completion. No details of the test have been reported.

Fort Bend County: A potential new well in the Thompson field, Gulf Oil Corporation's 34-A, F. I. Booth, flowed 163.55 barrels of oil on a ⅛-inch choke, tubing pressure 600 pounds, casing pressure 1040 pounds, gas-oil ratio 284-1, from sand topped at 5325 feet. Total depth is 5355 feet.

South Louisiana

Ten Locations Staked During Week in Area

Interest in South Louisiana this week centered around abandonment of two deep tests. In Assumption Parish, Shell Oil Company's State-Lake Verret 1, in Lake T-13s-13e was abandoned at 12,514 feet in hard sandy shale. Arkansas Fuel Oil Company also gave up LaTerre 1, Section 1-19s-13e, Creole Bayou area of Terrebonne Parish, at 11,327 feet, with no shows reported.

Buckley-Bourge 2, Section 1-20s-16e, Delarge area, Terrebonne Parish, being drilled by Union Producing Company and Fohs Oil Company, was drilling below 13,416 feet in shale. Fitzpatrick-Vizard 1, in the same area, the deepest producing well in the world, is only 60 feet deeper than Buckley-Bourge 2.

Ten locations were staked in South Louisiana during the past week, scattered in 10 parishes. Among these was a wildcat in Terrebonne Parish, Blanchard 1, on the Humphreys prospect, by Sun Oil Company, proposed 10,000-foot test. That company also staked an outpost at the Egan field, in Acadia Parish, Freeland 1, Section 29-9s-1w. At Krotz Springs, St. Landry Parish, Humble Oil & Refining Company staked another test, Prince 2, Section 25-6s-6e.

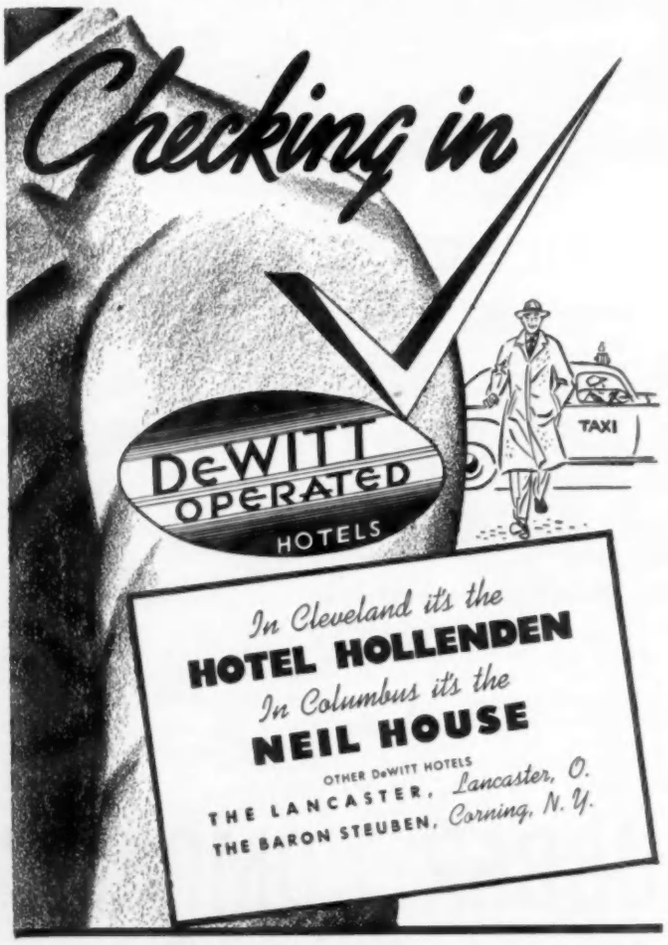
St. Landry Parish: The Texas Company's Swift 1, NE 14-5s-7e, 2½ miles northeast of Krotz Springs, blew out at 10,617 feet, necessitating a sidetrack job. Late in the week the test was drilling below 10,757 feet in the sidetracked hole.

Plaquemines Parish: In the Bastian Bay area, Phillips Petroleum Company's Fasterling 3 is waiting on storage before taking a production test in perforations at 9180-83 feet. Some oil was obtained on a drill-stem test at this depth. Bottom of the hole is at 11,135 feet, with casing to 9300 feet.

Jeff Davis Parish: In the China area, Continental Oil Company and Union Sulphur Company's Shoesmith 1, Section 1-8s-4w, is preparing for a new test higher in the sand section. The well was first tested in perforations at 9500-04 feet and recovered some gas with salt water. Total depth is 10,092 feet, with 5-inch set to 9563 feet.

In the South Roanoke field, Union Sulphur Company's Lognion 1, Section 22-10s-4w, has plugged back to 10,118 feet, made a squeeze job and is waiting to perforate for a production test.

Vermilion Parish: Union Oil Company is preparing to run an electric log



PETROLEUM PRODUCTION ENGINEERING

By LESTER C. UREN

Professor of Petroleum Engineering
University of California

VOL. I—Oil Field Development. New Second Edition, thoroughly revised and enlarged. Chapter Headings: Properties, Occurrence and Associations of Petroleum; Petroleum Exploration Methods; Acquisition of Title to Oil Lands; Developing the Field; Drilling Equipment and Methods; Churn Drilling Equipment and Methods; Rotary Drilling Equipment and Methods; Casing, Casing Appliances and Casing Methods; Fishing Tools and Methods; Oilfield Hydrology; Exclusion of Water from Wells; Finishing the Well; Well Records.

531 pages, 6x9, 258 illustrations. Price $5.00

VOL. II—Oilfield Exploitation. Here are up-to-the-minute data on how to drain petroleum from its reservoir rocks, how to bring it to the surface and prepare it for shipment, how to care for and remove impurities from the crude petroleum, how to design, construct and operate pipe lines. The book is based on the author's contacts with all the important oil-producing regions of the United States.

741 pages, illustrated. Price $6.00

Send orders to

The Gulf Publishing Company
P. O. Box 2608 **HOUSTON, TEXAS**

When Holes Are Deep and Formations Hard or Tough

. . . it's Gardner-Denver 14 x 14 Drilling Engines

Why? Because they have power—plenty of power to drill the deepest holes through the hardest or toughest formations.

—And because they are built "tough"—to withstand the terrific strain of modern deep well drilling.

NOTE THESE FEATURES:

- **VALVE GEAR** is adjustable to suit varying power requirements—easy to operate and adjust—assures greatest steam economy.
- **HIGH STEAM EFFICIENCY**—because short and direct steam ports decrease clearance—steam cylinders are built for 400 pounds pressure per square inch.
- **LONGER LIFE OF RINGS AND PORTS**—because single eccentric valve gear gives a quick opening valve—reduces wire drawing.
- **TOTALLY ENCLOSED ENGINE CONSTRUCTION**—provides protection against water and dirt—valve driving mechanism is enclosed in main frame.
- **AMPLE LUBRICATION**—even at slowest operating speeds—assured by five-feed large capacity lubricators with diaphragm check valves that force oil to all essential bearings.
- **FEWER MOVING PARTS**—metallic packing in all stuffing boxes.

●

For complete information and specifications, write Gardner-Denver Company, Quincy, Ill. · Dallas · Houston · Tulsa · St. Louis · Los Angeles · San Francisco New York · Chicago · Pittsburgh · Republic Supply Company (of California), 2122 East 7th St., Los Angeles, California · Continental Supply Co., Continental Bldg., Dallas, Texas.

GARDNER-DENVER

Since 1859

Here's a New One

Now some chap formerly high up in Government circles has written a book in which he argues that the old fashioned American idea of thrift is an economic mistake. It brings on depressions! So, he says, let's everybody spend all we make as we go along, thus creating a perpetual prosperity, and then we don't need to worry about old age because Uncle Sam is putting aside money to take care of us when that time comes. So now you've seen and heard everything except —unless you're already in the know— the cheerful service handed out here at Pelco in spite of war-time conditions.

WE'VE SUPPLIED OIL MEN IN OUR AREA FOR 36 YEARS

PELICAN WELL TOOL & SUPPLY CO.

SHREVEPORT LOUISIANA

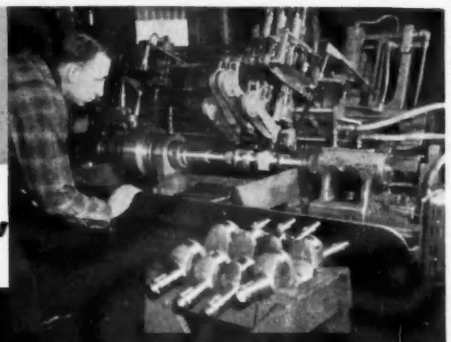
PELCO

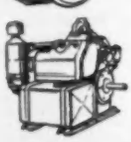
Houston
Berwick
Houma
New Iberia
Lake Charles

SUPERFINISHED CRANKSHAFTS

another **"PLUS FEATURE"**

IN ALL **WISCONSIN *Air-Cooled* ENGINES**





The very ingenious, specially designed machine illustrated above, puts a mirror-smooth *superfinish* on the crank-pins of all Wisconsin Air-Cooled Engines. By combining perfectly synchronized rotating and oscillating polishing movements, absolutely uniform diameter is maintained over the full length of the crankshaft bearing surfaces.

This is just another of the many small, but *important production details* that account for Wisconsin heavy-duty serviceability and smooth, efficient operation. Just another reason, too, why *your equipment* should be powered by a Wisconsin engine.

Most H.P. per pound

WISCONSIN MOTOR Corporation

MILWAUKEE 14, WISCONSIN, U. S. A.

World's Largest Builders of Heavy-Duty Air-Cooled Engines

WRITE TO HARLEY SALES CO.
510 ATLAS BLDG., TULSA, OKLA.
M & M BLDG., HOUSTON, TEXAS
OIL FIELD DISTRIBUTOR FOR WISCONSIN ENGINES AND ALL TYPES OF UTILITY UNITS

in Louisiana Furs 2-C, Section 31-16s-2e, in the Freshwater Bayou section. Total depth is 9042 feet.

North Louisiana

Field Activities Spurt With a Dozen Locations

A dozen new locations have been made in North Louisiana parishes during the past week, indicating an end to a lull in activity of the past three months. Most of the new locations are in Tensas and Concordia Parishes in the Lake St. John and Holly Ridge areas. Chicago Mill & Lumber Company, Magnolia Petroleum Company, Union Producing Company, and Stanolind-Carter have made new locations in Holly Ridge after recent completions there.

The California Company has made location for a second well in Lake St. John field, Beasley 2, 8-9-10e, after completing Brown 2, 4-9-10e, making 146 barrels through 9/64-inch choke from 3400-3405 feet.

Arkansas

Three Failures in Week Darken Wildcat Picture

The Arkansas wildcatting campaign suffered a serious setback last week with three operations being abandoned and no new tests announced. Leasing activities continued, however, in areas of Union County, pointing to the possibility that more wildcats may be started at an early date.

The three failures were in different counties: M. E. Davis' Harry Ezell 1, 2-13-27, Hempstead County; DeKalb Agricultural Association's Bass-Bemis 1, 35-14-21, Nevada County; and Placid Oil Company's Raoy Mathis 1, 21-18-2, Chicot County.

Indications that a well which failed in the lime about 5 years ago may become a producer from the Cotton Valley section were seen in showings at 5700 and 5900 feet in G. H. Vaughan's W. L. Jameson 1, C S½ NE 15-17-20, on the north edge of Magnolia field, Columbia County.

C. M. Crotty has taken over Murphy & Head's Murphy 1, 8-16-15, Norphlet area of the Smackover field, and will attempt to obtain shallow sand production after the well proved a failure in the lime.

Union County: Lion Oil Refining Company's Powledge 1, 21-18s-17w, east edge of Schuler field, has ceased to flow and a pumping unit is being installed. The well was flowing 150 barrels of oil and 400 barrels of salt water per day. Marine Oil Company has rig up to drill Fee 1, SE NE 20-18s-17w, also on the east edge of the field.

Michigan

Wildcat Operations Are 40 Percent of Total

Forty percent of the 136 Michigan operations, including drilling wells, rigs and locations, are wildcats, probably the highest percentage of wildcats to all operations in the state's history. Of 108 permits issued this year, 50 were wildcats.

One answer to the current ratio of exploratory tests to the total is found

The Grizzly Bear is large, heavy and rough—a full-grown specimen often measuring nine feet and weighing approximately a thousand pounds. It is said to be one of the most tenacious of all wild animals, and a formidable foe when wounded.

WHY GRIZZLY DRILLS MORE FOOTAGE

---and More Wells

GRIZZLY
Pressure-Seal
ROTARY HOSE

A 50-foot length of Grizzly Hose snaked out on warehouse floor, illustrating its exceptional flexibility.
PRESSURE SEAL
3 GRIZZLY POWERFLEX

Grizzly couplings *cannot pull out or blow out*... There are *no nipples to cut out*... The hose is steel-armored and full-flow *throughout its entire length*... All these advantages are due to the exclusive Grizzly pressure-seal and steel-armored features—genuinely important developments in rotary hose design and construction which insure drilling the maximum footage and number of wells.

GRIZZLY MANUFACTURING COMPANY
(Formerly E. M. Smith Company)
MANUFACTURING PLANTS: LOS ANGELES, CALIFORNIA AND PAULDING, OHIO
Complete Warehouse Stocks Maintained At:
Houston, Texas • Oklahoma City, Oklahoma • Casper, Wyoming
Export: The Continental Supply Co. Inc., New York, N. Y.

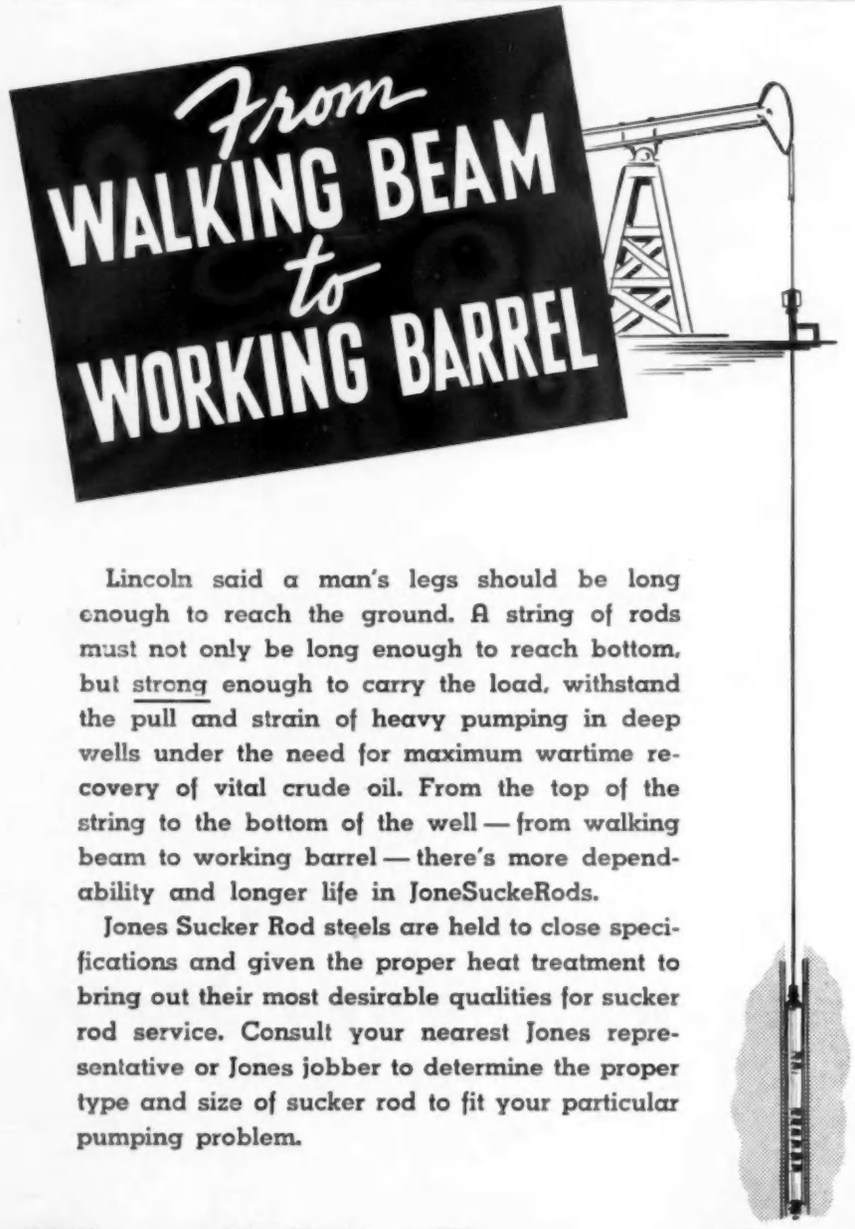
in the comparatively low number of field or developmental wells. On numerous occasions more wildcat rigs have been running than at this time but field development also was at a high level and far in excess of the current rates.

Probably the much sought for increase in crude prices would cause some lift to field drilling as nearly all of the so-called proven areas that are undrilled fall in the edge classification or in pools where recoveries are by experience both low and uncertain.

Irrespective of prices, labor and materials, no big development program could be initiated at this time without benefit of some important field discoveries. Relaxing of spacing regulations to permit at least 20-acre unit drilling probably would result in considerable inside work in fields discovered since 1941.

How far operators will go on a secondary development program once spacing is relaxed is highly uncertain at this time. That some little work would be undertaken is indicated by the fact that with few exceptions all new fields have been developed on a 20-acre pattern with only one of the units being drilled. Center-unit drilling has not been carried out except in a few instances.

Arenac County: Rose and Bolger's State 1, SW SW NW 14-19n-3e, ½ mile north of the Adams pool, cored oil saturation at 3050-63 feet, pointing to a possible field extension. Casing has been set at 2917 feet, top of the Dundee, for production test.



Lincoln said a man's legs should be long enough to reach the ground. A string of rods must not only be long enough to reach bottom, but strong enough to carry the load, withstand the pull and strain of heavy pumping in deep wells under the need for maximum wartime recovery of vital crude oil. From the top of the string to the bottom of the well — from walking beam to working barrel — there's more dependability and longer life in JoneSuckeRods.

Jones Sucker Rod steels are held to close specifications and given the proper heat treatment to bring out their most desirable qualities for sucker rod service. Consult your nearest Jones representative or Jones jobber to determine the proper type and size of sucker rod to fit your particular pumping problem.

The S. M. Jones Co.

○ JoneSuckeRods ○

General Office and Factory, Toledo, Ohio . . . . . Sales Office, McBirney Bldg., Tulsa, Okla.

Export Office: 21 West St., New York, N. Y.

Rocky Mountain Area

Much Activity Promised In Rangely Field Area

Two locations for deep tests were released in the Rangely field, Rio Blanco County, Western Colorado, 10 miles from the Utah boundary, showing promise of becoming one of the most active areas in the Rocky Mountain region. Newton Oil Company announces it will drill Gentry 1-D, NE SW Lot 8, 3-1n-102w, to the Dakota sand to test possibilities of developing oil down dip in the Dakota. It will be drilled with cable tools through the Dakota and if the sand is dry or water bearing, 10¾-inch casing will be cemented through the sand and the hole will be carried on to the Weber sand with rotary. The company controls leases on the south side of the structure. Wells drilled near the crest of the dome have developed gas flows in the Dakota.

Wasatch Oil Refining Company and Idaho Refining Company have acquired deep rights from the McLaughlin interests in Sections 32, 33, 34 and 35-2n-102w, and have spudded McLaughlin 1, NW NW NE 32-2n-102w. This will be a Weber test.

The California Company and Equity Oil Company's Emerald 1, C NE SW 30-2n-102w, location which was released February 21, has let contract to Loffland Brothers and is moving in rotary tools for a Weber sand test. The California Company and Union Pacific Railroad are the largest leaseholders in the field. The California Oil Group, Ltd., hold the shallow rights (shale oil) on much of the A. C. McLaughlin land. Stanolind Oil & Gas Company acquired a block of 3000 acres on the southeast side of the structure in 1943 and Phillips Petroleum Company has a tract of 1760 acres on the east side. The Texas Company also holds acreage on the structure and other lease holders include Barnsdall Oil Company, Cameron Oil Company and United Oil Company.

Little Grass Creek: Continental Oil Company's Unit 1, C SE NE 11-46n-99w, Little Grass Creek field, Hot Springs County, Wyoming, is drilling in Amsden at 6403 feet, headed for the Madison. It logged top of the Tensleep at 6105 feet and a test in that horizon appears to have been disappointing although results have not been released to date. The well encountered 1182 feet of water in the Embar at 5849-64 feet.

Dry Creek: Ohio Oil Company's N.P.R.R. 18, NE NE SW 3-7s-21e, Carbon County, Montana, is drilling at 7070 feet for a test of the Madison lime. The Tensleep sand, top at 6865 feet, was hard and tight and showed only slight saturation. Dry Creek is located 18 miles northwest of the Elk Basin field, one of Wyoming's largest producers of Tensleep oil.

Alkali Anticline: Yale Oil Corporation's Government 1, C SE NE 33-55n-95w, Alkali anticline wildcat in Big Horn County, Wyoming, first well to test the north dome of the structure, has been abandoned at 3525 feet after failing to find production in the Madison lime. It plugged back and acidized Embar at 2412-24 feet and 2445-63 feet, from which oil saturated cores were recovered, with negative results. Alkali anticline consists of two domes on an anticline 6 miles long. The south dome was tested several years ago at a location 2½ miles south of the Yale well and had good gas showings and some oil at 2507 feet but was abandoned when it encountered water at 2518 feet.

United States Well Completions

ARKANSAS

Columbia County — Dorcheat Macedonia Field: McAlester Fuel Co.'s Pinewood Lumber Co. B, n½ se 16-18-22, sandstone oil pay 8230, perf 44 shots 8272-76 ft, 135 bbls, 8/64-in, td 8464 ft.

Carter Oil Co.'s Caldwell 1, sh½ of se¼ 12-18-22, dual compl limestone gas 8918 ft, perf 80 shot 8918-8938 ft, 122 bbls, 16/64-in, sandstone gas 8133, perf 48 shot 8133-36 ft, 116 bbls, 16/64-in, td 9000 ft.

Phillips' McWilliams-Willis 1 (Suckle), n½ se 18-18-21, dual compl, sandstone oil 7939 ft, perf 7939-49 ft, 62 bbls, 13/64-in; sandstone gas 8946 ft, perf 115 shots 8946-70 ft, 18 bbls in 6 hrs, 12/64-in, td 9053 ft.

Nevada County—Troy Field: Plymouth Oil Co.'s C. H. Tompkins 1, se se 3-14-20, abnd 5270 ft.

ARKANSAS WILDCATS

Hempstead County—Failure: M. E. Davis' Harry Ezzell 1, c se se ne 2-13-27, abnd 4000 ft.

Nevada County — Failure: DeKalb Agricultural Ann's Bass Remis 1, c ne ne 35-14-21, abnd 3860 ft.

Chicot County — Failure: Placid Oil Co.'s Roy Mathis 1, 1980 e 1650 s of nw cor 21-18-12, abnd 4660 ft.

CALIFORNIA

Fresno County—Coalinga: Section Thirty Oil Co.'s 11, se ne se 30-19-15, pump 16 bbls 16-gr oil, 4 wtr, 60 ft perf 1505 ft, td 1505 ft.

Shell's 187-27, ne se se 27-19-15, pump 131 bbls oil, 60 wtr, perf 1920-2039, 2049-79, 2109-39, 2157-2257 ft, black shale 1904 ft, td 2285 ft.

Standard's 111-28A, sw sw sw 28-19-15, pump 36 bbls 17.4-gr, 62 ft perf 3020 ft, td 3123 ft, pb 2993 ft.

Standard's 31-17E, nw ne nw 17-21-15, pump 74 bbls, 40 ft perf 3240 ft, td 3581 ft, pb 3245 ft.

Standard's 101-3C, ne sw ne 3-20-15, pump 106 bbls 20.9-gr, 139 ft perf 3543 ft, td 3545 ft.

Texas Co.'s A-7, ne nw ne 6-20-15, pump 22 bbls 12.6-gr oil, 11 wtr, 39 ft perf 1430 ft, td 1435 ft.

Tide Water's 13-A, ne se sw 8-21-15, pump 9 bbls 13.3-gr oil, 4 wtr, 100 ft perf 3259 ft, td 3349 ft.

Fresno County—Helm: Amerada's Gunn F-1-35, c nw nw 35-16-17, flow 110 bbls 30-gr oil, 21,000 gas, 10/64-in, perf 8160-65 ft, td 8260 ft.

Kern County—Belridge, South: Belridge Oil Co.'s 11A-34, nw nw nw 34-28-21, pump 25 bbls 15.9-gr oil, 3 wtr, 478 ft perf 1090 ft, td 1090 ft.

General Pet. Corp.'s 2-1, sw nw nw 1-29-21, pump 53 bbls 14.1-gr oil, 10 wtr, perf 851-880, 950-1032 ft, td 1033 ft.

General Pet. Corp.'s 3-1, sw nw sw 1-29-21, pump 64 bbls, perf 589-634, 847-902 ft, td 1020 ft, pb 904 ft.

Mid-State Pet. Co.'s Bear State 38, ne nw nw 30-28-21, pump 7 bbls 17-gr, 40 ft perf 716 ft, td 716 ft.

Kern County—Fruitvale: (OWDD) Western Gulf's KCL-B 21, flow 511 bbls 18.2-gr, perf 3375-85, 3460-80 ft, otd 3875 ft, deepened to 4572 ft.

Kern County—Greeley: Standard's KCL 11-42, ne se ne 13-29-25, flow 903 bbls 37-gr oil, 745,000 gas, 12/64-in, 59 ft perf 11,480 ft, td 11,482 ft.

Kern County — Midway-Sunset: Chanslor Canfield Midway Oil Co.'s G 34-25, sw se nw 25-31-22, pump 32 bbls 19-gr oil, 4 wtr, perf 2250-225, td 2479 ft.

General Pet. Corp.'s Moco 35-278, ne se sw 35-12-24, pump 125 bbls 13.6-gr oil, 18 wtr, perf 1796-2026, 2134-2198 ft, td 2200 ft.

Union's Mid-Northern 6, nw nw nw 7-11-23, pump 12 bbls 12-gr oil, 88 wtr and sand, td 1914 ft.

Kern County—Poso Creek: Standard's 5-38, ne se nw 5-28-27, pump 12 bbls 14.9-gr oil, 3 wtr, 20 ft perf 2627 ft, td 2700 ft, pb 2630 ft.

Kern County — Round Mountain: General Pet. Corp.'s Railroad 4, se se ne 23-28-28, pump 120 bbls oil, 100 sand and wtr, 11 ft perf 2612 ft, td 2613 ft.

Kern County—Williams: Shell's 77-6, nw se se 6-28-29, flow 120 bbls, 27/64-in 100/640 lbs, 100 ft perf 2474 ft, td 2475 ft.

Los Angeles County—Inglewood: Standard's L.A.I. 1-88, 8-2-14, pump 293 bbls oil, 19 wtr, 644 ft perf 3400 ft, td 8303 ft, pb 3400 ft.

Los Angeles County—Richfield: Standard's A.U. 1-5, 34-3-9, pump 36 bbls oil, 94 wtr, 67 ft perf 3518 ft, td 3609 ft, pb 3520 ft.

Los Angeles County — Santa Fe Springs: (OWDD) Union's Bell 87, pump 12 bbls oil, 10 wtr, otd 3727 ft deepened to 6223 ft, pb 6122 ft.

Los Angeles County—Torrance: St. Francis Oil Co.'s Spencer Comm. 3300 ft s 300 ft w c/l Valerie and Huntington, pump 50 bbls oil, 12 wtr, perf 3167-3255, 3335-3640 ft, td 3650 ft.

Orange County — Brea Olinda: (OWDD) Shell's Orange 24, 1132 ft n 3882 ft w sec lease, 2-3-10, pump 158 bbls, 1298 ft perf 4508 ft, otd 1850 ft, pb 1640 ft, pulled 5½-in and deepened to 4525 ft.

San Luis Obispo County—Arroyo Grande: Wm. C. McDuffie's Dollie 2, ne sw se 3-31-13, pump 50 bbls 13-gr, perf 877-1028, 1072-1201 ft, td 1287 rt.

Santa Barbara County—Santa Maria Valley: Pacific Western's Samarin 4, sw se nw nw 27-10-34, pump 146 bbls 16-gr oil, 100 wtr, 474 ft perf 5100 ft, td 5100 ft.

Union's Cook 2, 990 ft s 330 ft e nwc Lillie Cook lease, 30-10-33, pump 663 bbls 12-gr, 631 ft perf 2791 ft, td 2793 ft.

Union's O'Donnell 2-7, 1150 ft sly 1650 ft wly fr nec O'Donnell 2 lease, 20-10-34, pump 247 bbls oil, 164 wtr, perf 5536-5408, 5230-4758 ft, Franciscan 5489 ft, td 5538 ft.

Union's Silva 3, 330 ft s 330 ft e nwc Silva lease, 13-10-35, pump 8 bbls 16.1-gr oil, 2 wtr, 333 ft perf 5088 ft, td 5090 ft.

Ventura County — Piru: Pacific Western's Samarin 4, sw se nw 27-10-34, pump 146 bbls 16-gr oil, 100 wtr, 474 ft perf 5100 ft, td 5100 ft.

Ventura County — Shiells Canyon: Texas Co.'s 146, sw nw sw 4-3-14, pump 200 bbls 32.5-gr, perf 2512-2933 ft, td 2700 ft.

Ventura County — Ventura Avenue: Lloyd Corp.'s 13, 1072 ft 6 10, 239 ft e R.C.L. cor No. 11, gas lift, 638 bbls 31.5-gr oil, 213,000 gas, 28/64-in, 410 ft perf 9975 ft, td 9975 ft.

Shell's Taylor 11 (OWDD), flow 1198 bbls 31.7-gr oil, 1,280,000 gas, 27/64-in, 800/1300 lbs, 480 ft perf 7865 ft, otd 5830 ft, deepened to 7870 ft.

Shell's Taylor 149, 200 ft n 3125 ft w C.L. No. 11, flow 936 bbls, 40-3264-in, 175/1050 lbs, 607 ft perf 8872 ft, td 8876 ft.

Ventura Avenue—Rincon: Honolulu's Whitten Permit 56-6, 7-3-24, flow 331 bbls 29.6-gr, 14/64-in, 400/800 lbs, td 2736 ft.

CALIFORNIA WILDCATS

Contra Costa County — Failure: Standard's Prod. Prop. 2, sw ne ne 28-3-3, abnd 4240 ft.

Kern County—Failure: Richfield's Tejon B-14-36, ne sw sw 36-11-19, Chanac zone 1993 ft, Santa Margarita 2060, abnd 2314 ft.

Kern County—Discovery: Standard's 54, sw sw se 27-31-23, flow 624 bbls 31.1-gr oil, 238,000 gas, 20/64-in, 78 ft perf 4438 ft, td 4460 ft, pb 4440 ft.

Kern County — Failure: Western Gulf's Quinn A-1, sw se ne 8-25-27, Jasmine area, granite, abnd 3566 ft.

Kern County—Failure: Wilshire Oil Co.'s Hartfield 1, ne ne ne 32-28-29, Round Mountain area, abnd 2609 ft.

Los Angeles County—Discovery: Barnsdall Oil Co.-Bandini Pet. Co.'s Roosa 1, se nw ne 29-3-16, nw Aliso Canyon area, pump 64 bbls 15-gr oil, 64 wtr, 230 ft perf 5830 ft, fair oil sand 5600-5750 ft, Eocene 6472 ft, Brown Miocene shale 6174 ft, td 6627 ft, pb 5830 ft.

Tulare County—Failures: Amerada's Dinuba Comm. 26-2, se ne sw 26-16-24, Kingsburg area, abnd 1078 ft.

Amerada's Dinuba Comm. 29-2, nw sw se 29-16-24, Kingsburg area, abnd 1391 ft.

ILLINOIS

Clark County: Stohr Bros.' Beasley 1, nw sw nw 3-10n-14w, pump 6 bbls, 275 ft.

Clay County: Gulf's Keck 6, se se sw 26-4n-7e, pump 36 bbls, 2623 ft.

Fayette County: Kingwood Oil's Tappe 1, nw sw ne 22-5n-4e, abnd 2581 ft.

Gallatin County: Carroll's Hughes 1, se nw sw 9-8s-10e, abnd 2125 ft.

Hamilton County: Robinson et al's Felix 2, nw ne se 12-3s-7e, pump & flow 267 bbls, 3380 ft.

Jefferson County: Central Pipe Line's Holloway 1, se ne 13-2s-4e, flow 550 bbls, 3071 ft.

Marion County: Texas Co.'s Boles 3, ne nw sw 15-1n-2e, pump 104 bbls, 2116 ft.

Richland County: Young et al's Bierhaus 6, nw sw sw 13-4n-11w, 1,625,000 gas, 778 ft.

Saline County: Farvis Bros. et al's Sisk 1, se nw ne 15-10n-6e, abnd 1522 ft.

Wabash County: Shell's Wilkinson 1, sw sw se 17-1n-12w, abnd 2571 ft.

Texas Co.'s Sandwell Comm. 1, sw se ne 30-1n-12w, abnd 2374 ft.

Wayne County: Pure's Pedicord 3-A, ne se sw 9-1s-6e, pump 22 bbls, 3177 ft.

Pure's Cooley 1, sw se 28-1s-7e, abnd 3326 ft.

Pure's Thomas 2, sw se 11-1s-8e, pump 6 bbls, 3137 ft.

Pure's Nettleton 1, ne nw nw 15-1s-8e, abnd 3247 ft.

Gulf's Braddock 1, sw nw nw 18-2s-5e, abnd 3110 ft.

Gulf's Rabern 1, sw se nw 18-2s-5e, abnd 3127 ft.

White County: Continental's Brown 3, ne sw nw 25-5s-10e, pump 9 bbls, 2850 ft.

ILLINOIS WILDCATS

Hamilton County—Discovery: Nat'l Assoc. Pet.'s York-Tibbs Comm. 2, sw nw nw 35-4s-7e, pump 20 bbls, McCl 3428-42 ft, td 3442 ft.

Jefferson County—Failure: Magnolia's Dewwitt 1, nw nw nw 16-2s-3e, abnd 2921 ft.

Madison County—Failure: Herndon Drlg.'s

Wells Completed in the United States in Week Ended April 1, 1944

Data preliminary and subject to revision. Revised and more complete data on all completions shown in monthly summary of drilling, published in second issue of each month. More detailed data on wildcats published in third issue of each month.

State or District	FIELD COMPLETIONS: New Wells *Oil	Gas	†Input	Dry	Total	Old Wells Deepened	WILDCAT COMPLETIONS *Oil	Gas	Dry	Total	ALL COMPLETIONS This Week	Last Week	Cumulative This Year	Cumulative Last Year
Alabama													1	
Arizona												1	2	
Arkansas	3			1	4				3	3	7	3	45	59
California	32				32	4	2		6	8	44	41	480	315
Colorado												1	9	5
Georgia														1
Illinois	8	1		9	18		1		6	7	25	34	386	466
Indiana									1	1	1	3	74	72
Iowa														2
Kansas	14			6	20		1	1	11	13	33	29	470	377
Kentucky	3			1	4				4	4	8	9	152	72
Louisiana	4			2	6				7	7	13	9	158	136
North Louisiana	2				2				5	5	7	3	50	53
South Louisiana	2			2	4				2	2	6	6	108	83
Michigan	3			1	4	1			3	3	8	13	143	112
Mississippi													27	18
Missouri													3	3
Montana	3			1	4						4	4	64	43
Nebraska													7	17
New Mexico	3	1			4				1	1	5	8	110	65
New York	15		10		25						25	26	325	293
Ohio	2	2		1	5						5	7	198	227
Oklahoma	18			11	29	2					31	24	382	346
Pennsylvania	27	8	15		50						50	57	711	612
Tennessee													3	1
Texas	67	3		20	90	5	8		18	26	121	115	1,351	953
E.Tex.Bor. Co.'s													4	6
E. Texas Field													1	2
Rest of E. Texas	2			1	3		1		3	4	7	5	74	52
North Texas	13	1		7	21	1					22	27	309	223
W. Central Tex.	2			1	3	1	1			1	5	9	94	76
West Texas	24			1	25	2	1		3	4	31	28	364	215
Tex. Panhandle	3	2			5						5	3	49	65
G. Coast, Upper	4			1	5	1			2	2	8	9	111	63
G. Coast, Lower	13			5	18		3		2	5	23	19	217	140
Southwest Texas	6			2	8		2		6	8	16	10	102	92
S. Central Tex.				2	2				2	2	4	5	26	19
West Virginia	2	11		4	17						17	13	239	154
Wyoming	3				3		1		1	2	5	6	43	32
Total U.S.	207	26	25	57	315	12	13	1	61	75	402	403	5,383	4,381

* Includes distillate wells. † Includes salt water disposal wells.

Laffey 1, sw sw nw 17-3n-7w, abnd 3025 ft.

Randolph County—Failure: Gill's Tittsworth 1, ne sw se 13-5s-6w, abnd 600 ft.

Saline County—Failure: Ohio's Land-Gibbons Comm. 1, sw sw nw 33-10s-7e, abnd 930 ft.

Wayne County—Failures: Tick's Withrow 1, se ne 32-1s-5e, abnd 3181 ft.

Pure's Simmons 1, e sw se 9-1n-7e, abnd 3295 ft.

INDIANA WILDCAT

Posey County—Failure: Heath's Daudistel 1, se se nw 32-5s-13w, abnd 3049 ft.

KANSAS

Barton County—Kraft-Prusa: Sohio's Dolechek 1, c nw se 29-16s-11w, Arb 3329 ft, BHB 1392 bbls, 3331 ft.

Barton County—Felts: Gulf's Wells-Hoffmeister 1, c n½ ne se 23-16s-12w, Arb 3328 ft, pump 281 bbls, 3341 ft.

Barton County—Ellinwood: J. H. Hershey's Wolf B-5, ne sw ne 1-20s-12w, Arb 3360 ft, abnd 3390 ft.

Butler County—Eldorado: Dustin & Bennett's Jackson 1, ne ne se 24-25s-4e, Chat 2514-15 ft, pump 200 bbls, 2515 ft.

Magnolia's N. A. Koegler 70, se sw nw 29-26s-5e, Viola 2596 ft, pump 5 bbls oil, 20 bbls wtr, 2641 ft.

Butler County — Reynolds-Schaffer: Saco's Welling 1, nw sw ne 16-27s-6e, Viola 3116½, abnd 3119½ ft.

Ellis County—Riverview: Champlin's Johnson 4, se se nw 29-11s-18w, Arb 3538 ft, 300 gals acid, pump 261 bbls, 3547 ft.

Ellis County—Leiker: Phillips' Wassinger 2, c n½ nw se 15-15s-18w, Arb 3615 ft, abnd 3646 ft.

McPherson County—Lindsborg: Bay Pet.'s Fornberg 1, c w½ sw sw 18-17s-3w, Viola 3385 ft, 1500 gals acid, pump 151 bbls, 3409 ft.

McPherson County—Lindsborg: (semi-wildcat) Bay Pet.'s Carter-H. Johnson A-1, 24-17s-4w, c w½ ne ne, Viola 3399 ft, 1500 gals acid, pump 137 bbls oil, 45 bbls wtr, 3451 ft.

Phillips County—North Dayton: Magnolia's A. H. Morgan B-1, c sw ne 12-2s-19w, KC 3371-73 ft td 3504 ft, abnd and pb 3316 ft.

Pratt County — Carmi: Magnolia's C. J. Singer 8, c se se 31-26s-12w, Arb 4298 ft, 1000 gals acid, pump 259 bbls, 4311 ft.

Pratt County—Cunningham: Transwestern's Sellens 2, c e½ sw sw 3-28s-11w, Lsg 3545-47 ft, pump 111 bbls fluid, 20% wtr 7 hrs, 3857 ft.

Pratt County—Chitwood: Lion O. & R.'s Mawdsley 1, ne nw se 22-28s-12w, Arb 4471-74 ft, 1000 gals acid BHB 1753 bbls, 4474 ft.

Deep Rock's Coulson 2, ne sw sw 23-28s-12w, Arb 4482 ft, BHB 3212 bbls, 4465 ft.

Rice County—Genesco: B. & R. Drilling Co. et al's Kemple 1, nw ne sw 35-18s-8w, Arb 3284 ft, abnd 3300 ft.

Russell County — Chegwidden: Mid-Plains' Chegwidden B-1, c n½ se sw 29-15s-11w, granite wash 3256 ft, pump 100 bbls, 3259 ft.

Russell County—Trapp: Trapp et al's Gross A-2, se sw ne 5-15s-13w, Arb 3225 ft, td 3250 ft, pb and abnd 3036 ft.

Russell County—Karst: Derby Oil's Karst 3, ne nw ne 27-15s-14w, Arb 3342 ft, 500 gals acid, pump 200 bbls, 3345 ft.

Stafford County — Heyen: Transwestern's Hallman 1, se se sw 13-22s-12w, Arb 3652 ft, abnd 3657 ft.

KANSAS WILDCATS

Barber County — Discovery: Dicket Oil's Mills 1, c se sw 32-31s-14w, perf 20 shots 4023-25 ft, 500 gals acid, 3,000,000 gas, td 4685 ft.

Cowley County—Failure: Boggs Fee 1, sw se nw 29-34s-5e, abnd 3175 ft.

Dickinson County—Failures: Wolf Creek et al's Mustard 1, swc ne 17-11s-1e, abnd 3411 ft.

Stanolind's Equitable Life 1, ne nw se 17-12s-1e, abnd 3310 ft.

Jackson County — Failure: McLaughlin's Kelly 1, c sw ne 24-8s-15w, abnd 2538 ft.

Pratt County—Failure: Mabee's Eubank 1, nwc 4-27s-14w, abnd 4652 ft.

Reno County—Failures: Mid-Continent's De-Muth 1, c se sw 11-24s-9w, abnd 4272 ft.

Phillips' Hartnett 1, sw sw ne 13-24s-13w, abnd 4115 ft.

Russell County — Failure: Armour et al's Schwein 1, ne nw nw 24-15s-15w, abnd 3398 ft.

Saline County—Failure: Heber et al's Nelson 1, ne ne se 29-15s-1w, abnd 2708 ft.

Stafford County — Discovery: Faulkner's Welch 1, nwc sw 18-21s-12w, 2500 gals acid, pump 980 bbls, Arb 3554 ft, td 3563 ft.

Stafford County—Failures: Phillips' Thole 1, nwc 23-23s-12w, abnd 3848 ft.

Skelly's Landreth 1, se se ne 33-24s-14w, abnd 4295 ft.

KENTUCKY

Henderson County: Carter's Buckman 2, 24-P-21, flow 360 bbls, 2242 ft.

McCracken County: Butler County Oil's Brown Heirs 5, 9-H-32, pump 20 bbls, 532 ft.

Mansfield's Hammer 3, 12-H-32, pump 12 bbls, 457 ft.

Union County: Calstar Pet.'s Dyer et al 2, 13-O-18, abnd 2877 ft.

KENTUCKY WILDCATS

Hopkins County—Failure: Pure's Whitfield 1, 1-K-25, abnd 2970 ft.

McLean County—Failures: Slaughter's Durbin 1, 3-L-27, abnd 635 ft.

Producers Pipe Line's Price 1, 22-M-30, abnd 1311 ft.

Webster County — Failure: Vanderbark's Poole Comm. 1, 15-N-24, abnd 2006 ft.

NORTH LOUISIANA

Tensas Parish—Holly Ridge: Union Producing Co.'s Penrod-Jordan 4, 20-11n-10e, flow 240 bbls, perf 8355-88 ft, ¼-in, td 8410 ft.

Stanolind-Carter's Glover 1, 19-11n-10e, flow 31 bbls per hr fr 3390-4810 ft, ¼-in, td 8450 ft.

Concordia Parish—Lake St. John: California Co.'s Brown 2, 4-9-10e, flow 146 bbls, 9/64-in, from 3400 to 3405 ft.

NORTH LOUISIANA WILDCATS

De Soto Parish—Failure: A. W. Phillips' Anthony 1, c se sw 9-11n-14w, abnd 3323 ft.

Franklin Parish—Failure: H. M. Marr, O. G. Collins-Titanic Oil Co.'s Baker 1, 26-16n-9e, abnd 7112 ft.

Lincoln Parish—Failure: Arkansas Louisiana Gas Co.'s Liner Unit 1, ne ne se 31-19n-3w, abnd 6204 ft.

Tensas Parish—Failure: David Lide's Fee 1, 22-12n-12e, abnd 9865 ft.

Morehouse Parish — Failure: Roeser and Pendleton's Taylor 1, 1-21-7e, dry and abnd 6602 ft.

Claiborne Parish—Failure: Big West Drlg Co.'s Rainach 1, 16-22n-5w, dry and abnd 9250 ft.

NORTH LOUISIANA OUTPOST

Claiborne Parish—Lisbon Failure: Big West Drilling Co.'s Alford B-1, ne sw sw 2-21-4w, abnd 7925 ft.

SOUTH LOUISIANA

Calcasieu Parish—Vinton: E. H. Robertson's Vincent Heirs 1, 300 s&w of ne cor sw 34-10s-12w, Hackberry 4887 ft, abnd 5000 ft.

East Baton Rouge Parish—University: Wm. Helis' Dearing Community 1, 1979 n 82° w

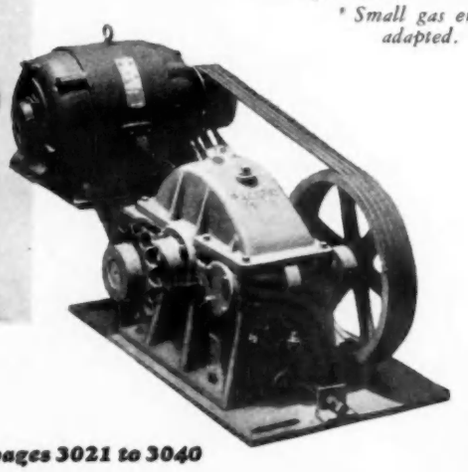
PACIFIC
BANDWHEEL DRIVES

If you are having trouble getting delivery on complete portable oil well pumping units for your newly drilled wells, here is one way you can overcome delays and perhaps step up existing production.

Pacific-Western manufactures a highly efficient band-wheel drive consisting of integral (*) power unit, multiple V-belt drive, gear reducer case and chain and sprocket drive to band-wheel shaft. This band-wheel drive unit, together with existing equipment you may have around the yards, can be adapted to your present producing wells. Oil well pumping units on these wells may then be shifted to new holes. The band-wheel drive unit, by reason of its low power consumption and slower pumping speed, is increasing output on many older wells and at the same time materially reducing operating costs.

Give our engineers a chance to help you lick production problems.

** Small gas engines can be adapted.*



See our catalog, pages 3021 to 3040

1944 Composite Catalog

COMMERCIAL OFFICES AT: 11181 LONG BEACH BLVD., LYNWOOD, CALIF.

WESTERN GEAR WORKS

PLANTS: SEATTLE, LYNWOOD, VERNON, SAN FRANCISCO

Assured by 47 Years of Producing Faultlessly Fabricated Derricks

Parkersburg derricks are the signs of civilization at the end of many a trail. Here's one at a remote point in Brazil. By the Pyramid gin pole you can know it's a Parkersburg unless, by chance, the owner of another make has demanded the addition of this patented, exclusive Parkersburg derrick feature. And, the Pyramid gin pole is just one of the numerous advantageous features Parkersburg improvements have added to derricks through continuous advancements since the turn of the century.

Men who know derricks know that the further they operate from the source of supply, the more they need Parkersburgs. From long experience they know there's less trouble to come from the engineering design, practical construction and extra strength Parkersburg has been fabricating into quality derricks almost since the time derricks were first used in drilling oil wells.

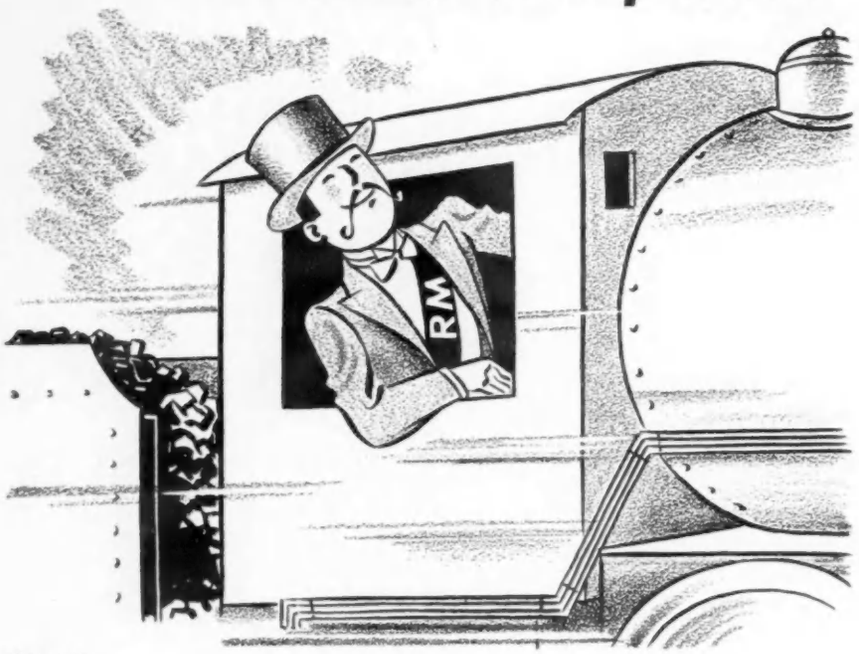
When you buy derricks, don't just buy . . . buy Parkersburgs

THE PARKERSBURG RIG & REEL CO.
EXECUTIVE OFFICES, PARKERSBURG, W. VA.
OCS DIVISION, COFFEYVILLE, KANSAS
Dallas • Houston • Tulsa • Los Angeles • New York

OCS

PARKERSBURG

R/M PACKINGS
throttle the joints



Today's locomotives are typical users of R/M packings. Steam connections, valves, pistons, air-brakes are some of the spots where R/M serves to speed supplies—when extra wearability means many more miles of service.

Railroads and other vital industries must have first call on R/M production in time of war, but we will continue to try to serve your requirements through your regular mill-supply house.

ARMY E NAVY

INDUSTRIAL SALES DIVISION
RAYBESTOS-MANHATTAN, INC.
MANHEIM, PA.
BRIDGEPORT, CONN. NORTH CHARLESTON, S. C. PASSAIC, N. J.
Makers of Packings for Every Industrial Use

821.7 n 8° e of se cor 43-8s-1w, in 65-7s-1w, perf 9225-73 ft, pump 149 bbls, 6/64-in, td 10,005 ft.

St. James Parish—Hester: Humble's Colonial Sugars 3, start nw cor sec 57 go sly on wl 4298.7 th ely at ra 2051.9 in 17-11s-4e, abnd 9329 ft.

Terrebone Parish—NE Gibson: Shell's Realty Operators B-20, s 33° 07 mins w alg ei sec 13 fr ne cor th n 53° 53 mins w 330 to lcn in 13-17s-15e, perf 9199-9208 ft, 5½ 7530 ft, flow 309 bbls 35.8-gr, 9/64-in, td 9350 ft.

SOUTH LOUISIANA WILDCATS

Assumption Parish—Failure: Shell's State-Lse No 346 1, 1980 fr n 4620 e of sw cor sec 30 in Lake Verret T-13s-13e, Cibicides 8852 ft, abnd 12,514 ft.

Terrebonne Parish—Failure: Arkansas Fuel Oil Co.'s LaTerre Co. 1, 1963 w 667 n of se cor 1-19s-13e, abnd 11,327 ft.

MICHIGAN

Allegan County — Fillmore: Devonian and Lang's Boeve 2, ne sw nw 12-4n-15w, Traverse, pump and flow 67 bbls, td 1584 ft.

Osceola County—Rose Lake: Rose and Bolger's Prosch 1, s½ sw nw 31-19n-9w, Traverse, swab and flow 39 bbls, td 3135 ft.

Ottawa County—Holland: Regal Dutch Pet. Co.'s Zeerip-Rietman 1, ne nw sw 36-5n-15w, Traverse, pump 11 bbls, td 1521 ft.

Van Buren County—Bangor: Raymond F. Donnersberger's Fitzroy 1, ne se sw 20-2s-16w, Traverse, abnd 1021 ft.

MICHIGAN WELL DRILLED DEEPER

Clinton County: J. E. Hood's Gurnsey 1, ne sw ne 19-8n-4w, Dundee 2861 ft, dry otd 2885 ft, deepened and abnd 2885 ft.

MICHIGAN WILDCATS

Isabella County—Failure: Chartiers Oil Co.'s Salter 1, s½ se se 18-13n-3w, abnd 1618 ft.

Tuscola County — Failure: Wicklund Dev. Co.'s Carolan 1, n½ se ne 9-14n-10e, Dundee 2650 ft, abnd 2855 ft.

Van Buren County—Failure: W. H. Clock's Edwards 1, ne se ne 18-2s-15w, Traverse 1070 ft, abnd 1073 ft.

MONTANA

Glacier County—Cut Bank: K. D. Pardee's Castle-Tribal 3, 210, nw sw ne 13-32n-6w, swab 29 bbls 17 hrs, Cut Bank 2968-95 ft, 5½-in 2972 ft, Sunburst 2915-37 ft, td 3014 ft.

Toole County—High Gravity: Big West Oil Co.'s Govt. 1, sw nw se 13-35n-4w, pump 48 bbls Ellis-Madison, 500 gals acid, td 2340 ft.

Rim Rock Producing Co.'s Autz 1, nw se se 13-35n-4w, pump 75 bbls oil, some wtr, Ellis-Madison 2390 ft, 500 gals acid, td 2393 ft.

Toole County — Kevin-Sunburst: Pfabe & Engelking's Danielson 3, nw ne ne 20-35n-1w, pump 60 bbls Ellis-Madison 1570 ft, 500 gals acid, td 1571 ft.

Prevol & Shay's Govt. 10, sw sw sw 11-35n-3w, Ellis-Madison 1775 ft, abnd 1843 ft.

NEW MEXICO

Lea County—Arrowhead: Continental-Atlantic-Stanolind-Standard of Texas's Lockhart 6-B, c se se 1-22s-36e, 206,000 gas, 6000 gals acid perf 2910-3610 ft, td 3757 ft, pb 3655 ft.

Lea County — Mattix: Plains Prod. Co.'s Knight-Humble 6, c ne sw 14-24s-37e, flow 110 bbls, 32/64-in, shot 320 qts 3500-3590 ft, td 3600 ft.

Lea County—Rhodes: Amerada's State 3-A-J, c ne nw 27-26s-37e, flow 732 bbls, 1-in, shot 170 qts 3160-3245 ft, td 3260 ft.

Lea County—West Eunice: Wilson Oil Co.'s State-Shell 12, sw ne se 13-21s-34e, flow 400 bbls, 2-in, 3788-93 ft.

NEW MEXICO WILDCAT

Eddy County—Failure: H. W. Martin et al's State 1, c se se 36-21s-27e, elev 3115 ft, White lime 2105 ft, Delaware 2300 ft, abnd 2655 ft.

OKLAHOMA

Caddo County — Cement: Pepper et al's School Land 1A, c ne nw 13-5n-9w, sd 5433-5470 ft, flow 99 bbls in 6 hrs, 2,000,000 gas 24 hrs, td 6912, pb 5500 ft.

Carter County—Tussy: Jones Oil's McCrory 2, se nw nw 5-1s-3w, sd 3496-3505 ft, td 4090 ft, pb and abnd 2660 ft.

Creek County—SE Stroud: J. E. Crosbie's Elle 7, se se ne 17-14n-7e, Prue 2855 ft, shot 280 qts, flow 49 bbls, td 2934 ft.

Phillips' Rosier 1, se nw sw 17-14n-7e, Prue 2918 ft, shot 240 qts, flow 53 bbls, 3001 ft.

Creek County—Glenn: Gulf's Drew 31, ne se se 6-17n-12e, Glen 1428 ft, shot 200 qts, pump 33 bbls, 1597 ft.

Garfield County—Garber: Sinclair Prairie's Hartley 59, nw ne nw 18-22n-3w, sd 1542-45 ft, pump 43 bbls, 1572 ft.

Hughes County — W. Holdenville: R. L. Hodge's Jacobs 1B, se nw nw 14-7n-8e, Calvin 1203 ft, shot 20 qts, pump 10 bbls, 1231 ft.

Hughes County—W. Horns Corner: Deep Rock's J. F. Meyers 1, se se ne 7-7n-10e, sd 3588-92 ft, flow 250 bbls, 3595 ft.

Kay County—Vernon: Dave Morgan's Dubel 2, se sw sw 21-29n-1e, Miss Chat 3421 ft, td 3478, pb and abnd 3400 ft.

Love County—Unnamed: N. F. Merrick & Magnolia's Tate Unit 1, c se ne 6-6s-2e, Springer 3304 ft, abnd 4013 ft.

Marshall County—Cumberland: Pure's Little

Is the Patterson-Ballagh Pipe Wiper good?

These Men Say yes

DRILLER
"Men work better, less fishing jobs, less blowouts. Make better showing on job."

ROUGHNECK
"Hands and feet dry. Work on dry floors. Clean pipe. Slips grip pipe in freezing weather."

DERRICK MAN
"Drill pipe is dry. Elevators easy to latch. Mud doesn't bother me. Job safer."

TOOL PUSHER
"Less mud weight material to handle. Men quit less. Less stuck drill pipe. Less worry about water supply."

PETROLEUM ENGINEER
"Well completed better as less small junk in hole. Stratas better tested on wildcats. Better chance for completion on schedule, within budget."

Reports from domestic as well as from overseas operations bring astonishing testimonials of the job Patterson-Ballagh Pipe Wipers are doing in service. Now made of PBX artificial rubber, these wipers are oil, gas and weather-resistant. The synthetic rubber, of special formula developed by Patterson-Ballagh engineers, has the essential "snap." It grips the pipe and experience in the field indicates very satisfactory wearing quality.

Users report savings that are unbelievable. They have declared that the saving of one fishing job has paid for the Wipers used for years to come. For example, one user tells us of a fishing job saved that will pay for Pipe Wipers for his wells for the rest of his life.

If you are not now using these Wipers, it certainly will be to your advantage to investigate. Made in all sizes, no tools needed to install.

See Composite Catalog

PATTERSON-BALLAGH
Los Angeles 1 • Houston 10 • New York City 6

PATTERSON-BALLAGH

PIPE WIPERS

SAFETY ENGINEER
"Less danger from slippery floors, infected hands and fire."

DRILLING SUPT.
"Better working conditions. Less well trouble, means better showing for me."

GEOLOGIST
"With no wash water, can tell more accurately absorption of stratas passed through."

PURCHASING AGENT
"Less rush orders for fishing tools, less mud weight material to buy. Cost reduced."

LEASE SUPT.
"Less steel in hole to cause trouble when wells serviced. Heavy oil on work-over jobs eliminated."

109 6, nw nw nw 20-5s-7e, McLish 5988 ft, flow 672 bbls, 480,000 gas, 6049 ft.

Pure's Little 100 5, nw ne se 28-5s-7e, 2nd Oil Creek 6248 ft, flow 4224 bbls, 5,750,000 gas, td 6385 ft, pb 6308 ft.

Oklahoma County—W. Edmond: Bourland's M. French 2, c sw nw 33-14n-4w, Bois d'Arc 6716-6806 ft, 1000 gals acid, flow 300 bbls, 6904 ft.

Oklahoma County—Jones: Jordan's Namechek 1, se sw nw 29-13n-1e, Dewey 3790 ft, abnd 4832 ft.

Osage County—N. Pioneer: W. C. Norris' Osage 5, sw ne ne 29-21n-11e, Miss 2000 ft, abnd 2004 ft.

Osage County—Osage City: Ohio's Osage 13, nw se sw 36-22n-8e, sd 436-65 ft, shot 30 qts, pump 8 bbls oil, 25 bbls wtr, 520 ft.

Pottawatomie County—Wanette: Watchorn's McCoy 1, nw ne sw 30-6n-3e, Viola 4162 ft, abnd 4232 ft.

Watchorn's Welch 1, nw sw ne 20-6n-3e, Sylvan 4135 ft, td 4197, pb and abnd 3100 ft.

Pottawatomie County—Gray: (semi-wildcat) Mealy-Wolfe's Lovelace 1, se se nw 27-6n-4e, Dolomite 3540 ft, abnd 3601 ft.

Pottawatomie County—W. Burnett: Stanolind's Wallace 1, sw se sw 19-8n-2e, Wilcox 6242 ft, td 6296 ft, pb 1500 ft.

Pottawatomie County — Grisso: Atlantic's Ewton 3, se sw nw 34-9n-3e, Hunton 4798 ft, abnd 4834 ft.

Seminole County—Wewoka Lake: Mealy-Wolfe's D. D. Lack 1, ne nw se 2-8n-7e, Booch 3286-3321 ft, flow 100 bbls, 3362 ft.

Seminole County — Unnamed: Gulf's McDaniel 1, se sw sw 27-10n-7e, Booch 3432 ft, shot 15 qts, flow 15 bbls, 3596 ft.

Stephens County—Doyle: Ven-Mex's Akers 2A, c ne sw nw 11-1n-5w, limey shale 5726-32, abnd 6465 ft.

Stephens County—Woolsey: J. B. Beard's Baker 1, sw sw nw 36-2s-6w, lime 1442-46 ft, pump 4-5 bbls, 1842 ft.

Stephens County—Comanche: Geo. Pace's Ruby Marks 3, nw nw se 13-2s-8w, sd 2165-73, td 2173 ft, pb and abnd 2155 ft.

Geo. Pace's McMasters B-4, nw sw ne 13-2s-8w, sd 2410-22, show oil, abnd 2570 ft.

Stephens County—W. Loco: J. E. Jackson's Dilley B-2, nw se ne 7-3s-5w, lime 1142-56 ft, pump 70 bbls, 1161 ft.

J. E. Jackson's Massey B-3, nw nw nw 8-3s-5w, sdy lime 1085-97 ft, pump 10 bbls, td 1185 ft, pb 1132 ft.

OKLAHOMA WELLS DEEPENED

Stephens County—East Loco: J. G. Beard's Hefner 1, sw sw sw 12-3s-5w, top sd 942-50 ft, otd 1275 ft, pump 8 bbls, td 1423 ft.

Pottawatomie County—Shawnee: Stanolind's U. R. Rushing's 2, se sw se 32-11n-4e, Earlsboro 4397-4444 ft, pump 160 bbls, otd 4431 ft, td 4454 ft.

WEST TEXAS

Andrews County—Fullerton: Ohio Oil Co.'s University (Lse No. 3763) 1, c nw se sec 6, blk 13, elev 3335 ft, flow 1095 bbls, 1½-in, 12,500 gals acid 6795-7189 ft.

Andrews County—North Cowden: Atlantic-Sun's Holt 9-C, c se nw T&P 7, blk 43, T-1-N, pump 191 bbls oil, 40% wtr, shot 420 qts 4470-4640 ft.

Cochran County—Rhodes: Atlantic's Dean 4, 660 ft out se cor lab 1, lge 89, Lipscomb CSL, flow 223 bbls, 2-in, 10,000 gals acid 5040-74 ft.

Cochran County — Slaughter: Texas Co.'s Mallet 17-F, c lab 16, lge 51, Scurry CSL, flow 640 bbls, 2-in, 10,000 gals acid 5010-41 ft.

Ector County—Goldsmith: Gulf's Goldsmith 393, 440 ft snl 2166 ft ewl T&P 19, blk 44, T-1-S, flow 2520 bbls, 2-in, 4500 gals acid, td 4290 ft.

Hockley County — Slaughter: Eugene Constantin et al's Lawless 3, c lab 7, lge 42, Rains CSL, flow 529 bbls, 7000 gals acid 4840-79 ft.

Gulf's Mallet 16, 4640 ft snl 660 ft wel PSL 6, blk X, pump 233 bbls oil, 2% wtr, 10,500 gals acid, td 5030 ft.

T. F. Morrow et al's Mallet 63, c lab 21, lge 48, Edwards CSL, flow 1174 bbls, 10,000 gals acid 4910-60 ft.

T. F. Morrow et al's Mallet 66, c lab 18, lge 48, Edwards CSL, flow 847 bbls, 10,000 gals acid, 4909-81 ft.

T. F. Morrow et al's Mallet 72, c lab 8, lge 48, Edwards CSL, flow 552 bbls, 10,000 gals acid 4910-54 ft.

T. F. Morrow et al's Oil Dev. Co.-Willard 4, 440 ft out nw cor lab 24, lge 45, Edwards CSL, pump 295 bbls, 12,000 gals acid 4885-4915 ft.

Texas Co.'s Slaughter 153, 580 ft out sw cor lab 77, lge 38, Zavalla CSL, flow 1292 bbls, 12,000 gals acid 4900-5011 ft.

Mitchell County — Westbrook: Anderson-Prichard Oil Corp.'s Morrison 1-B, ne se se T&P 29, blk 28, T-1-N, pump 146 bbls, shot 290 qts 2940-3085; 570 qts 2850-3085, 1400 qts 2948-3065 ft, td 3085 ft.

Col-Tex Ref. Co.'s Abrams-T. P. Land Trust 16, 993 ft nsl 1659 ft wel T&P 33, blk 28, T-1-N, pump 109 bbls oil, 5 bbls wtr, shot 1190 qts 2825-3105 ft.

Reagan County — Grayson: Skelly et al's University-Grayson 8, se nw sw sec 33, blk 8, pump 55 bbls oil, 70% wtr, 500 gals acid 3059-68 ft, td 3080 ft.

Ward County—Gulf-O'Brien: Gulf's O'Brien 203, se ne se G&MMB&A 22, blk F, flow 285 bbls, 2-in, td 2759 ft.

Gulf's Hutchings 176, ne ne sw G&MMB&A 9, blk 0, flow 472 bbls, td 2700 ft.

Winkler County—Emperor: Skelly's Halley 68, ne sw nw PSL 16, blk B-11, flow 629 bbls, ½-in, shot 300 qts 2748-2893 ft.

Winkler County — Keystone-Ellenburger: Sinclair Prairie's Walton 4-A, c se se PSL 20, blk 77, elev 2969 ft, Permian 7265 ft, Silurian 7415 ft, Montoya 8120 ft, Simpson 8120 ft, Ellen 9163 ft, flow 1672 bbls 43.3-gr, 895/1, ½-in, perf 9610-60 ft, td 9682 ft.

Winkler County — Wheeler-Ellenburger: Mid-Continent's Wheeler 1, c sw se T&P 10, blk 46, T-1-S, elev 3127 ft, Permian 7910 ft, Miss 7990 ft, Devonian 8345 ft, Silurian 9120 ft, Ellen 10,570 ft, flow 1802 bbls 46-gr, 1956/1, 36/64-in, perf 10,670-10,710 ft, td 10,743 ft.

Yoakum County—Ownby: Shell's Hammer 3, c se nw sec 490, elev 3571 ft, flow 319 bbls oil, 11.3% wtr, 5000 gals acid 5260-5306 ft.

Sinclair Prairie's Granger 3, c sw se sec 487, elev 3567 ft, brown lime 4350 ft, pump 245 bbls, 5000 gals acid 5260-5355 ft.

Yoakum County — Waples-Platter: Dr. & Explor. Co.'s Waples-Platter-Shell 2-A, c se nw sec 616, elev 3571 ft, abnd 5300 ft.

Yoakum County—Wasson: C. U. Bay et al's Lynn-Story 2, 1760 ft nsl 2200 ft ewl sec 770, pump 101 bbls oil, 36% wtr, 6000 gals acid 5008-5175 ft.

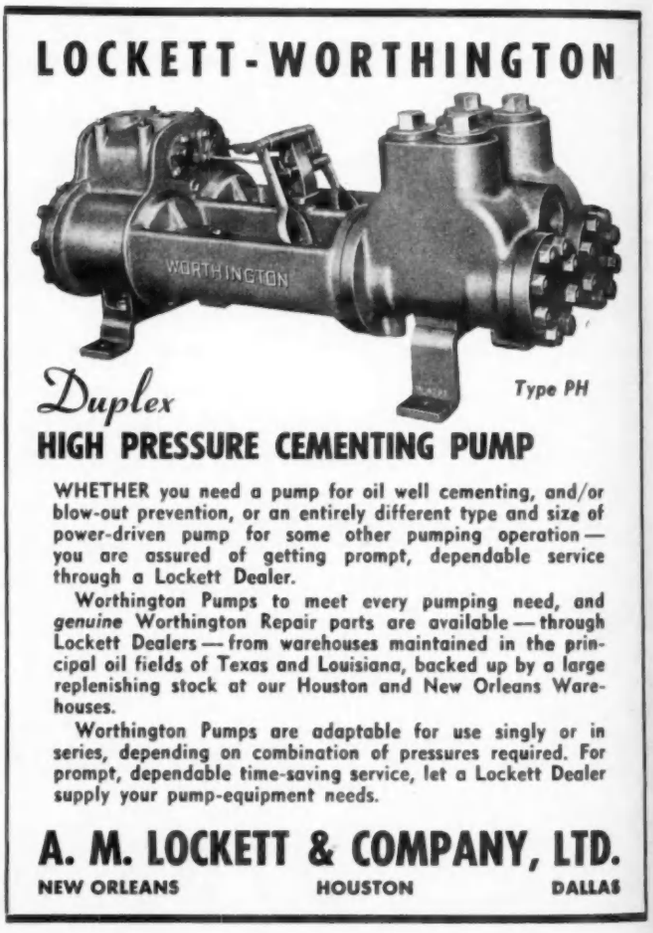
Gulf's Futch 5, c ne sw sec 796, flow 446 bbls oil, 17 bbls wtr, 10,000 gals acid, td 5205 ft.

WEST TEXAS WELLS DEEPENED

Winkler County — Keystone-Holt: Sid W. Richardson & Bass' Walton 2, 440 ft out se cor sw PSL 1, blk B-3, otd 3580 ft, San Angelo 4530 ft, flow 779 bbls, 17/64-in, 1000 gals acid perf 4731-68 ft, td 4772 ft.

Sun's Walton 3, 440 ft out se cor s½ PSL 8, blk B-3, otd 3372 ft, elev 2932 ft, San Andres 3840 ft, Holt 4954 ft, abnd 5029 ft.

K&E
REG. U. S. PAT. OFF.
I'LL TAKE THE WHITE ONE EVERY TIME!
WYTEFACE "A"
TRADE MARK
STEEL GAUGING TAPES
Easy-to-read, raised black graduations on crack-proof white surface... resist abrasion from oil, sand, scraping on the pipe pile, etc. In all sizes and types—in cases or reels. Ask your dealer—or write for catalog.
EST. 1867
KEUFFEL & ESSER CO.
NEW YORK • HOBOKEN, N. J.
CHICAGO • ST. LOUIS • SAN FRANCISCO • LOS ANGELES • DETROIT • MONTREAL


LOCKETT-WORTHINGTON
WORTHINGTON
Duplex
Type PH
HIGH PRESSURE CEMENTING PUMP
WHETHER you need a pump for oil well cementing, and/or blow-out prevention, or an entirely different type and size of power-driven pump for some other pumping operation—you are assured of getting prompt, dependable service through a Lockett Dealer.
Worthington Pumps to meet every pumping need, and genuine Worthington Repair parts are available—through Lockett Dealers—from warehouses maintained in the principal oil fields of Texas and Louisiana, backed up by a large replenishing stock at our Houston and New Orleans Warehouses.
Worthington Pumps are adaptable for use singly or in series, depending on combination of pressures required. For prompt, dependable time-saving service, let a Lockett Dealer supply your pump-equipment needs.
A. M. LOCKETT & COMPANY, LTD.
NEW ORLEANS HOUSTON DALLAS

DU PONT "FAST-COUPLER"

saves time— saves work

OPEN END OF FAST-COUPLER SLIDES OVER SECOND CARTRIDGE
—AND IT'S A ONE-MAN, ONE-STEP OPERATION TO JOIN CARTRIDGES TOGETHER
FAST-COUPLER COMES ATTACHED TO CARTRIDGE

SHOOTERS okay the Du Pont "Fast-Coupler" at once. It enables them to make up seismic charges in half the time ordinarily required.

One easy, quick operation joins cartridges securely together. Any crew member, even a new man on the job, can readily assemble charges that are strong and rigid, and that hold together when loading conditions are none too good.

The Du Pont "Fast-Coupler" is supplied in two popular sizes: 2″ diameter cartridges weigh 2½ pounds each; 2¼″ cartridges weigh 5 pounds each. Both sizes are available in 60% Seismograph "Hi-Velocity" Gelatin and "Seismogel."

Write for booklet illustrating the "Fast-Coupler" in actual use. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington, Delaware.

DU PONT "FAST-COUPLER"

IT WORKS FAST—IT HOLDS FAST!

DU PONT

REG. U.S. PAT. OFF.

The OIL WEEKLY'S TRADING POST

USED EQUIPMENT FORUM

CLASSIFIED ADS . . . EQUIPMENT . . . SERVICES . . . PERSONNEL

FOR SALE

■ Coryell County ranch, 2350 acres well improved, running water, two fine homes, open prairie grass land, adjacent to new paved highway now under construction. Price $25.00 acre. Write: MOORE & RUSH REALTY COMPANY, 406 FRANKLIN ST., WACO, TEXAS.

■ For Sale: 3 large fish tail drill bits 14 and 10 inches. Ray Foster, Muldoon, Texas.

■ FOR SALE—The following Used Equipment Located at Vinton, Louisiana

9 Ideco 94 Ft. galvanized steel derricks, 159,000-pound capacity with crows nest, excellent condition
8 G. E. Induction Motors, 15-35 H.P., 1150-550 R.P.M., 440 Volt, three-phase
6 Transformers
8 G. E. Manual Controllers, Service oil well pumping type C. R. 3209-60 cycle, D. L. 2203414, 35-15 H.P., 440 Volt, three-phase, with grid stand
6 3 sheave Ideco production crown blocks. 3 sheave 22" x 2" 15/16 trunnions, W/2—10" x 7" beams
1 Cable tool drilling crown block complete, W/5 sheaves, one 30" crown sheave, one 26" sand sheave and 4-24" casing sheaves all having 5" trunnions, W/Bearings, 4 Beams 12" x 8'
8 Boykin counter shaft and pulleys
7 Parkersburg standard rig complete with wooden band-wheel, wooden beam, steel pitman, Rex beam hangers
3 Westinghouse Nuttall Geared Units, 35-15 H.P.

5,000 ft. 10-inch casing, 20,000 ft. 7-inch casing, 15,000 ft. 2-inch tubing, 10,000 ft. ⅝-inch rods.

Available for inspection on appointment, James F. O'Meara, 603 May Street, Jennings, Louisiana. Phone Jennings 67-W.

FOR SALE
55,000 Barrel Oil Storage Tanks.
30—already down. Matchmarked, cleaned and ready to load.
Grade A steel. Mexia, Texas.
PICKENS AND BENDER
1406 Magnolia Building, Dallas, Texas
Phones L.D.-494 — Central-5818

FOR SALE

■ Beautiful Bosque county ranch, over 2000 acres, open prairie grass land, fine improvements, plenty fine barns and outhouses, artesian water. Price $35.00 acre, for any particulars write MOORE & RUSH REALTY COMPANY, 406 FRANKLIN ST., WACO, TEXAS.

■ **For Sale: 1 Clark 120 H. P. drilling engine with reversible clutch. Claud White, Breckenridge, Texas or J. L. Higginbotham, 2514 Commerce St., Dallas, Texas.**

■ Bonded Vibrating Screens are used to screen the mud coming out of wells and for all screening operations. Price $495.00. Immediate deliveries. Bonded Scale Company, 122 Bellview Avenue, Columbus 7, Ohio.

HELP WANTED

Major oil company has openings available for graduate petroleum engineers having at least 3 years acceptable experience general oil field development. Salary open. All hiring will be done in accordance with War Manpower Commission Stabilization Plans. Reply to Box No. 33, c/o The Oil Weekly, Houston, Texas.

■ WANTED: A Petroleum Engineer with field experience, for engineering development work, with a large manufacturer of oil field equipment and materials. Permanent position with good future for right man. In replying state age, education, business background, salary desired, etc. Address: Box 38, c/o The Oil Weekly, Houston, Texas.

BUSINESS OPPORTUNITIES

■ **Capital Seekers—Interested in raising $25,000 or more for a legitimate project should write to Amster Leonard, Fox Theater Bldg., Detroit 1, Mich.**

NOTICES

■ For License: A new, simple and efficient Gas Lift Installation now operating successfully in 5000 ft. wells. Address: Box 40, c/o The Oil Weekly, Houston, Texas.

ROTARY RIGS FOR SALE

3 CORE DRILLS, truck mounted, complete in all details, plenty of drill pipe, repair parts. Capacities 2,000' using 2⅞" drill pipe. Extra skid mounted pumps to give needed pressure and fluid volume.

6 ROTARY RIGS, all running, capacities from 2000' to 7000' using 3½" drill pipe. Plenty of drill pipe in following sizes: 6⅝", 4½", 3½", 2⅞", some run one well, some new. These rigs all have their own masts, complete in all details, large stock of repair parts for rigs, motors, pumps. Extra light plants, water pumps, swivels, hooks, blocks, rotary tables, mud hoses, drilling lines, various sizes of new rock bits, fishing tools.

SHOP EQUIPMENT for repairing rigs, motors, and pumps.

TRUCKS, enough to move all above equipment, consisting of Tandems and Tandem Trailers, dual wheel trucks and dual wheel trailers, all have winches, heavy beds, auxiliary transmissions, two speed axles, rolling tailboards. 9 ½ and ¾-ton pickups. Trucks and Pickups will be sold only with rigs.

Will sell complete as above or as individual rigs.
Address: Box 39, c/o The Oil Weekly, Houston, Texas.

WEST TEXAS WILDCATS

Pecos County—Failure: Phillips' University-Pecos 1, 665 ft snl 658 ft wel sec 1, blk 20, elev 2653 ft, Simpson 6200 ft, abnd in Ellen wtr 7384 ft.

Winkler County—Oil Discovery: Stanolind's Sealy-Smith 1, c sw sw G&MMB&A 50, blk A, elev 2778 ft, base salt 2350 ft, Yates sand 2520 ft, San Andres 4010 ft, flow 298 bbls 37.5-gr, 2998/1, ¼-in, 3000 gals acid Clear Fork perf 6170-6248 ft, td 6305 ft, pb 6248 ft.

Yoakum County — Failures: Helmerich & Payne et al's Higginbotham 1, c sw sw sec 539, elev 3733 ft, anhydrite 2230 ft, brown lime 4205 ft, San Andres 4630 ft, abnd 5420 ft.

Humble's Fillingim 1, c se ne sec 661, elev 3735 ft, anhydrite 2070 ft, San Andres 4580 ft, abnd 5640 ft.

WEST CENTRAL TEXAS

Coleman County — Silver Valley: Phillips' Sprinkles 1, 526 ft wel 330 ft nsl of w-240 ac GH&H Ry. 46, blk 2, top Gray (Strawn) 3563 ft, flow 84 bbls, 13/64-in, 3567-3614 ft.

Shackelford County: Roeser-Pendleton-Continental's Cook 22-A-117, 792 ft wel 1031 ft nsl ne E. T. Ry. 117, abnd 1740 ft.

Stephens County: Hanlon Gasoline Co.'s Carlisle-Gulf 1, 1575 ft snl 817 ft wel W⅔ T&P 25, blk 5, elev 1264 ft, Bend 3043 ft, Marble Falls 3956 ft, Ellenburger 4408 ft, pump 3 bbls oil, 6 bbls wtr, 2000 gals acid perf 3101-17 ft, td 4483 ft.

WEST CENTRAL TEXAS WELL DEEPENED

Jones County — Wimberly: Fain-McGaha's Dunigan-Varner 1, 1285 ft snl 1045 ft ewl blk 89, dd fr 2312 ft for dual comp, flow 129 bbls 2 hrs, ¾-in, 2000 gals acid 2415-45 ft; flow 800 bbls, ¾-in, 2000 gals acid 2508-32 ft, td 2536 ft.

WEST CENTRAL TEXAS WILDCATS

Jones County—Oil Discovery: John B. Byram-Cardinal Oil Co.'s J. M. Alexander 1, 2000 ft fr m/s/n 3000 ft m/w/w T&P 3, blk 14, 6200 ft nw nearest prod, elev 1599 ft, pump 80 bbls 38-gr, Bluff Creek 1647-58 ft.

SOUTHWEST TEXAS

Brooks County—Scott & Hopper: Humble's Scott & Hopper 3, 1980 fr s&el of ACH&B sur 107 on 28.9-ac lse, elev 240 ft, dual cond, sand perf 6528-44 ft, flow gas and cond, no gge; perf 6093-6103, 272 bbls 41.2-gr, 3/16-in, td 6857 ft.

Jim Hogg County — Armstrong: Humble's Stroman et al 4, 527 fr n 375 fr ne cor, E. L. Stroman sur 300-2, sand 3646 ft, 86 bbls 38-gr, 3/16-in, td 3652 ft.

Jim Hogg County—Colorado: Humble's King Rch-Colorado 30, 3300 fr nl 2640 fr wl of AB&M sur 42, on 640-ac lse, elev 585 ft, perf 3092-3102 ft, pump 8 bbls 46-gr, td 3104 ft.

Jim Hogg County—Weil: Sun's Weil Bros. 10, 2440 fr el 2144 fr nl of blk 4 7570 fr sl Palitos Blancos Gr on 25,733-ac lse, elev 474 ft, perf 5050-54 ft, 106 bbls 46-gr, 9/64-in, td 5055 ft.

Starr County—N. Sun: Sun's Montvalvo C-6, 3768 fr nl 5350 fr el Los Retachez Gr on 2870-ac lse, abnd 5806 ft.

Baldridge King & Nichols' Starr Co.-L&C Co. 1, 330 fr nl 467 fr wl w 80-ac of sh 45, J. S. de la Garza porc 88, perf 2492-2512 ft, 53 bbls, ¼-in, td 2516 ft.

W. L. Goldston's Kelsey 1, 532 fr nl 570 fr el of lot 25, Goodwin & Yantis subdvn of porc 86-87, perf 2522-32 ft, 78 bbls, 5/32-in, td 2747 ft.

Webb County—Bruni: Dulup Oil Co.'s Bruni 1, 330 fr s&el blk 7, 330 fr el 3900 fr nl sur 835, elev 842 ft, abnd 1638 ft.

ADVERTISING RATES

TRADING POST SECTION

Regular classified advertisements for this special section, set in type this size without border, take flat rate of 7 cents per word for the first insertion and 5 cents per word for each subsequent insertion of same copy. Display advertisements for this section, set in suitably larger type with ruled border, are $5.00 per inch for first insertion and $4.00 per inch for subsequent insertions. Remittance must accompany copy which should be sent to:

Trading Post Section, THE OIL WEEKLY
P. O. Box 2608 Houston 1, Texas

SOUTHWEST TEXAS OUTPOSTS

Duval County—Muralla Failure: Taylor Ref. Co.'s Rogers Est. A-1, 330 fr ne&sel of H&GN sur 19, abnd 4784 ft.

Jim Hogg County — Armstrong Extension: Magnolia's E. L. Armstrong 1, 330 fr n&el AB&M sur 96, on 640-ac lse, perf 3596-3602 ft, flow 18,000,000 gas, td 3645 ft.

SOUTHWEST TEXAS WILDCATS

Duval County—Failures: Argo Oil Corp.'s G. C. Canales 1, 330 fr sl Hogg city line, 330 fr el 433-ac lse, in sh 38, Jose Hinojosa Gr A-628, elev 470 ft, abnd 6003 ft.

Taylor Ref. Co.'s Atlee Parr D-2, 330 fr sl 895 fr el 80-ac tr, abnd 4738 ft.

Duval County—Discovery: Taylor Ref. Co.'s Valentin Sepulveda B-2, 330 fr s&wl, R. Sepulveda sur 15, sand 4214 ft, perf 4314-18 ft, gas well, on gge (shutin), td 5142 ft.

Starr County — Failure: Continental's Don Cameron 1, 330 fr n&el of e 293-ac of OCSD&RGNG sur, 512, abnd 4933 ft.

Lockhard & Davenport's Block Realty Co. 2, 330 fr nl 2500 fr el of 193-ac lse blk 28-B, J. de la Garza Falcon porc 80, abnd 1133 ft.

T. E. Stephens' M. Hinojosa et al 2, 7500 fr nwl 6000 fr swl 4767-ac lse, porc 109-110-111, Guerra 2073 ft, abnd 2104 ft.

SOUTH CENTRAL TEXAS

Bastrop County: J. D. Andrews' E. Zills 1, 1100 fr el 2200 fr nl of 644-ac tr, Thos. J. Gazley sur, abnd 1387 ft.

Bastrop County—Bateman: R. R. Ogden's A. A. Barber 1, 330 fr s&el of 22.8-ac lse, 275 fr swl 3780 fr sel, Joshua Gray sur, abnd 2231 ft.

SOUTH CENTRAL TEXAS WILDCATS

Bexar County—Failures: O. R. Mitchell's Fee 1, 1050 fr nl 440 fr el of 1069-ac tr, Jose Angel Navarro sur, abnd 1767 ft.

G. D. Reinhardt's Fee 1, 7900 fr el 1688 fr nl, Wm. Small sur 26, abnd in Edward lime 1501 ft.

LOWER TEXAS COAST

Bee County—Blaconia: Stanolind's Fox 1-B, 330 ft fr s'ly nl 660 ft fr e'ly el of 496-ac lse, Michael O'Donnell Lge, 5½-in 4980 ft, perf 4977-78 ft, flow 87 bbls, 5/32-in, td 4980 ft.

Bee County—Cosden-Wilcox: H. B. Zachry Co.'s Waugh 1, 467 ft fr nwl 2355 ft fr nel, John Pace sur, abnd 8293 ft.

Goliad County—Slick-Wilcox: Continental's Allen 2, 1630 ft fr swl 2970 ft fr nwl 508-ac lse, Obid Marshall sur, 6-in 7591 ft, perf 7564-79 ft, flow 222 bbls, 5/32-in, td 7591 ft.

Jackson County—Maurbro: Humble's Strauss 12, 457 ft se fr sel Albert Gayle tr 1800 ft w fr el 530-ac Mike Strauss lse, Abraham Clare sur, 5½-in 5203 ft, sand 5213 ft, flow 432 bbls, ¼-in, td 5224 ft.

Jackson County—Mauritz: Wirt Franklin Pet. Corp.'s Mauritz 2-C, 330 ft fr sl 2350 ft fr wl 850-ac lse, D. White sur, 5½-in 5811 ft, perf 5559-74 ft, flow 115 bbls, ⅛-in, td 5811 ft.

Jackson County—West Ranch: Humble's Toney 16-B, 2766 ft nw'ly nel of Toney tr fr its e cor w bank Lavaca River, th 1834 ft sw'ly at ra on 496-ac lse, Ramon Musquez Gr, 5½-in 5710 ft, sand 5720 ft, flow 633 bbls, ¼-in, td 5730 ft.

Jim Wells County—Seeligson: Sun's Canales 37, 3180 ft fr nl 400 ft fr wl, A. Canales sur 149, 3000-ac lse, se flank, dual comp, sand 5214 ft, 5½-in 6010 ft, perf 5215-30 ft, 110 bbls, ⅛-in; perf 5970-78 ft, flow 124 bbls, ⅛-in, td 6010 ft.

W. A. Richardson Oil Co.'s Englking-Middleton 1, 330 fr s&el sec 63, R. P. Haldeman subdvn of Seeligson Rch, Richard Ross sur 334, on 40.6-ac unit, elev 161 ft, dual comp, sand 5878 ft, perf 5910-16 ft, 132 bbls 41.5-gr, ⅛-in; sand 6070 ft, perf 6116-20 ft, 136.5 bbls 41.7-gr, ⅛-in, td 6248 ft.

Jim Wells County—Stratton: Chicago Corp.'s Phillip Wardner 41, 1829 fr nl 564 fr wl of sec 3, Chas. Stratton subdvn, Paso Anco de Arriba Gr, on 8782-ac lse, elev 120 ft, dual comp, sand 6380 ft, perf 6380-88 ft, 151 bbls 41-gr, ⅛-in; Bertram 6161 ft, perf 6162-6210 ft, flow gas-cond, ⅛-in, td 6442 ft.

Jim Wells County—Brownlee: Humble's E. M. Brownlee 2, 2882 fr sl 1563 fr wl 1014-ac lse, abnd 5390 ft.

Kleberg County—Stratton: Humble's King Ranch-Paso Ancho 38, 467 ft fr nel San Fernando Creek, 6350-ac lse, Paso Ancho de Abajo Gr, sand 6510 ft, perf 6507-14 ft, 135 bbls, ⅛-in, td 6650 ft.

Live Oak County: Humble's Pace 2, 330 fr nwly sel 886-ac lse, 1650 fr sel 7400 fr swl, John McMullen sur 15, abnd 4203 ft.

Nueces County—Agua Dulce: Union Prod. Co.'s Mable Elliff et al A-1, 2560 fr sl 1320 fr sl 550.08-ac lse 3000 fr el Antonio Longoria Gr, dual comp, sand 5001 ft, perf 5001-30 ft, flow est 47,000,000 gas, spray cond, lower sd perf 5125-35 ft, flow est 16,000,000 gas, spray cond, td 5400 ft.

Nueces County—Baldwin: Magnolia's J. C. Baldwin 17, 700 fr el 620 fr nl, J. P. McConnell sur, 911.52-ac lse, elev 48 ft, sand 3901 ft, perf 3903-07 ft, jet 431.8 bbls 25.5-gr, td 3970 ft, pb 3925 ft.

Nueces County—N. Stratton: Sam Wilson's Rivers Est. A-8, 467 fr sl 3100 fr wl 1859 fr el of n 364-ac of 801.25-ac Rivers Est, elev 125 ft, perf 5728-33 ft, 151.8 bbls 41.4-gr, ¼-in, td 5824 ft.

Nueces County — Turkey Creek: Republic

PROTECT EQUIPMENT AND SPEED OPERATION TOO!

GATKE BRAKE BLOCKS

- *Stand the Heat and Hold*
- *Feed off smoothly at all depths*
- *Pick up with positive, non-grabbing action*
- *Prolong flange life*
- *Wear incredibly long*

The *Extra Performance Qualities* of GATKE Brake Lining afford *easier* handling and *faster* operation with *reduced strain* on men and equipment. Rig Manufacturers *use it predominantly* as original equipment and for replacement.

Avoid substitutes. Your Rig Manufacturers have GATKE Brake Lining that's engineered for the job.

GATKE CORPORATION
228 N. LaSalle St. Chicago 1, Ill

WHERE *Safety* IS FOREMOST . . . JUSTRITE IS USED MOST

Around rigs, pipelines, wells, loading points or wherever there is danger of fire or explosion, Justrite All-Purpose Safety Lanterns are the finest money can buy. Justrite is the lantern preferred by those who think in terms of safety.

Approved by both Underwriters' Laboratories, Inc., for safe use in Methane Gas and Air Mixtures and by the U. S. Bureau of Mines (Approval 1017).

Reduce fire hazards . . . use Justrite.
Write for complete details and prices.

JUSTRITE MANUFACTURING COMPANY
2063 N. Southport Ave., Dept. G-3, Chicago, Ill.

Nat. Gas Co.'s J. G. Kennedy 1, 405 fr ely el 405 fr nl 465-ac lse, P. Hinojosa sur, and D. Martinez sur 420, jkd and abnd 1295 ft.

San Patricio County—E. White Point: Republic Nat. Gas Co.'s D. C. Rachal 45, on 1281-ac lse, M. M. Flores sur A-127, abnd 6009 ft.

Willacy County—Willamar: Pan American Prod. Co.'s Dan J. Jones 1, 1284 fr nl 483 fr wly el 213.46-ac lse, A. J. Jones subdvn of sh 13, San Juan de Carricitos Gr, perf 7904-14, 7918-50 ft, 203 bbls 31-gr, ¼-in, td 8044 ft.

LOWER TEXAS COAST OUTPOST

Aransas County—St. Charles: Continental's St. Charles Company 8, 12,700 ft fr sel of 16,505-ac lse, Aransas CSL sur, abnd 9520 ft.

LOWER TEXAS COAST WILDCATS

Bee County — Discovery: W. E. Rowe's Charles Peter 1, 330 ne th 330 se at ra fr most wly cor of 200-ac tr, sand 3749 ft, perf 3796-3806 ft, gas well no gge, td 4355 ft.

Goliad County—Failure: G. E. Green et al's Ida P. Huggins 2, 3265 fr most sly nl 2889 fr most wly wl of 5049.55-ac lse, Maria de Jesus Yarbron Gr A-50, abnd 4506 ft.

Jim Wells County—Tijerina Discoveries: 660 fr s&wl, Andres Canales sur 270, elev 500 ft, sand 7107 ft, perf 7117-25 ft, 257 bbls 39.2-gr, ⅛-in, td 7128 ft.

H. F. Wilcox O&G Co.'s W. M. Almond A-1, 467 fr nwl 1600 fr sl of SA&MG RR sur 13, elev 178 ft, sand 3221 ft, perf 3221-26 ft, est 1,150,000 gas, ⅛-in, td 5398 ft.

TEXAS GULF COAST

Brazoria County—Lochridge: Grubb & Hawkins' Wood et al 3, 1182 s 467 e of Wood 1 in Thomas Alsberry sur A-2, on 861½-ac lse, perf 6351½-55 ft, pump 19 bbls 27.4-gr, 385,000 gas, ¼-in, td 6378 ft.

Chambers County—E. Turtle Bay: Sun's C. J. Chambers et al 8, 431 fr n 725 fr wl 40-ac unit in ne cor 521-ac lse, M. A. Carroll sur, perf 6580-88 ft, pump 148 bbls 32.7-gr, 2.5% wtr, ⅛-in, td 6615 ft.

Harris County—Humble: Texas Co.'s Koehler-Fee 43, 1850 fr e 1200 fr sl 526-ac tr, J. B. Stevenson sur, perf 3390-97, 3367-76 ft, pump 48 bbls 23.5-gr, 2% wtr, td 6802 ft.

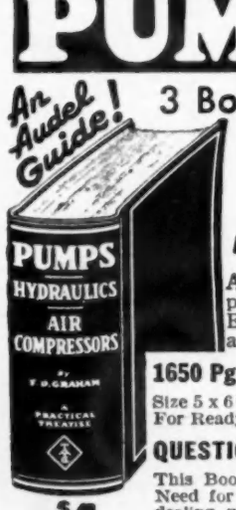
Jefferson County — Lovell Lake: Humble's Broussard 50, in C. Hillebrandt sur, perf 7720-22 ft, pump 160 bbls 37.3-gr, 105,360 gas, ⅛-in, td 7810 ft, pb 7765 ft.

Liberty County—Hull: Humble's Humble-S. E. Bevers et al Fee B-1, 330 fr nl 250 fr wl 13-ac tr, td 6900 ft, pb and abnd 6210 ft.

Free Examination

PUMPS

An Audel Guide! 3 Books in One!



Now Ready—

AUDELS PUMPS
HYDRAULICS
AIR COMPRESSORS

A New Modern-Comprehensive Guide for Engineers, Pump Operators and Mechanics.

1650 Pgs., 1654 Illustrations

Size 5 x 6¼ x 1⅛—Fully Indexed For Ready Reference including

QUESTIONS AND ANSWERS

This Book Covers a Long Felt Need for One Inclusive Volume dealing with the whole field of modern Pumps, Hydraulics, Air Compressors and the many lines that tie in. Easy to understand.

To get this assistance for yourself, simply fill in and mail *FREE COUPON* today.

$4 COMPLETE

PAY $1 A MO. ONLY

AUDEL, Publishers, 49 W. 23 St., New York 10

MAIL AUDELS PUMPS, HYDRAULICS, AIR COMPRESSORS (Price $4) on 7 days free trial. If O.K., I will remit $1 in 7 days and $1 monthly until the $4 is paid. Otherwise I will return it.

Name_____

Address_____

Occupation_____

Employed by_____

T.O.W.

TEXAS GULF COAST WILDCATS

Brazoria County—Failure: Stanolind's A. L. Holland 1, 3691 fr wly el 794 fr sl 612.44-ac lse, abnd 12,581 ft.

Hardin County—Failure: Sun's J. H. Barfield et al 1, start ne cor, W. Berryman sur, go w alg nl 1125 th n 330 at ra to lcn in sec 69 HT&B sur, abnd 6650 ft.

TEXAS GULF COAST WELL DEEPENED

Liberty County—Hull: American Republics Corp.-Houston Oil Co. of Tex.'s Fee 167, 2370 fr nl 2510 fr el 800-ac lse, otd 2173 ft, sand 2418 ft, pump 43 bbls, ¼-in, td 2437 ft.

EAST TEXAS

Wood County—Manziel: Amerada-Sun's McWhirter 1-B, 1700 ft wel 200 ft snl, John Polk sur, elev 492 ft, Paluxy 6354-63, broken 6380-97, pay 6397-6415 ft, flow 445 bbls, ¼-in, td 6415 ft.

Magnolia's Herring 1-A, 2250 ft wel 4825 ft nsl, Samuel Burch sur, elev 444 ft, Paluxy broken pay 6324-28, pay 6330-40, so 6346-68 ft, flow 368 bbls, ¼-in, perf 6351-67 ft, td 6368 ft.

Texas Co.'s Pittman 1, 3500 ft nsl 550 ft wel, Wm. Barnhill sur, elev 482 ft, Georgetown 5205 ft, Goodland 6397 ft, Paluxy series 6428 ft, abnd 6490 ft.

EAST TEXAS WILDCATS

Cherokee County—Failure: American Liberty Oil Co.'s Cobb-Holman Lumber Co. 1, 660 ft out nw cor of 160-ac lse, J. M. George sur, 2 mi s Ironton, elev 368 ft, Pecan 3526 ft, Austin chalk 4532-4742 ft, Woodbine 4853 ft, abnd 4920 ft.

Smith County—Sand Flat Discovery: Skelly's W. C. Chisum 1, 550 ft n 1400 ft w of nw cor Thos. Hawkins sur, but in Daniel Minor sur A-644, elev 432 ft, Georgetown 5614 ft, Mainstreet 6042 ft, Goodland 6820-6946 ft, Paluxy series 6950 ft, Glen Rose 7410 ft, massive anhydrite 8807-9095 ft, Rodessa 9265-87 ft, James 9520 ft, Pettit 9762 ft, Travis Peak 9925 ft, flow 132½ bbls 28.2-gr, 3/16-in, Upper Paluxy perf 6972-7025 ft, td 10,011 ft, lower hole junked, pb 7280 ft.

Henderson County—Failure: Sun-Magnolia's Genecov-Roosth 1, 467 ft out m/s/sw cor 927-ac tr, Martin Murchison sur, elev 498 ft, Pecan 4000 ft, Austin 5380-5690 ft, Woodbine 6377 ft, abnd 6459 ft.

Wood County—Failure: Magnolia's Lindley 1, 1035 ft fr m/n/n 825 ft fr m/n/el, Sarah McDonald sur, elev 487 ft, Pecan 2327-2510 ft, Austin 3790-3897 ft, Woodbine 4371 ft, Georgetown 5145 ft, Fort Worth 5680-5850 ft, Goodland 6153-6208 ft, Paluxy 6218 ft, Glen Rose 6525 ft, massive anhydrite 7570-7750 ft, Pettit 8318 ft, Travis Peak 8446 ft, abnd 8634 ft.

NORTH TEXAS

Archer County: J. A. McCarty-J. P. Coleman's Siebold 1, 1541 ft snl 300 ft wel, W. G. Pillow sur A-1022, abnd 1677 ft.

Clay County: Johnson & Gorman's Cheeves 5, 1320 ft nsl 1086 ft wel blk 55, Bacon sur, abnd 1328 ft.

Clay County—Joy: Shell's Scaling 4, 1650 ft snl 1955 ft wel blk 15, H. Williams sur, pump 72 bbls, shot 12 qts nitro 4000-12 ft.

Clay County—Wynn: Shell's Harris 1, 330 ft nsl 570 ft wel of 207.2-ac tr, C. Rooney sur, elev 1039 ft, Bend 5864 ft, Barnett 6112 ft, Mississippi 6216 ft, flow 2520 bbls, ¾-in, 2000 gals acid 6220-99 ft.

Cooke County: Benson Bros. et al's Fette 1, 330 ft out sw cor S. P. Ry. sec 7, A-980, pump 38 bbls, broken sand 1027-76 ft.

Bridwell Oil Co.'s Campbell 8, 600 ft ewl 1700 ft snl of n-629 ac, O. F. Leverett sur, pump 25 bbls, 756-66 ft.

Bridwell Oil Co.'s Parkey 1-A, 200 ft wel 1030 ft nsl of 224½-ac tr, O. F. Leverett sur, abnd 1453 ft.

Texas Co.'s Trubenbach 35, 764 ft snl 1670 ft ewl 203-ac tr, J. Clark sur A-194, pump 27 bbls, shot 10 qts 781-89 ft, td 799 ft.

Cooke County—Dangle: Phillips' Danglemayer-Dangle 1, 2340 ft snl 5193 ft wel, E. Langford sur, Ellen 2173 ft, flow 560 bbls, ½-in, perf 2183-2230 ft, td 2303 ft.

Jack County—McDonald: Champlin Ref. Co.'s Tibbs 3, 3114 ft snl 2494 ft wel lot 6, Wm. McDonald sur, pump 102 bbls, 3484-96 ft, td 3502 ft.

Jack County—Worsham-Steed: Auto Ordnance-Hooper & Byrne Co.'s Sewell 1, 4550 ft nsl 1884 ft wel, David Crenshaw sur, Bend 4692 ft, pump 119 bbls, 2000 gals acid, shot 20 qts nitro 4698-4712 ft.

Montague County—Hildreth: Continental's Gadberry 1-B, 1444 ft nsl 664 ft wel ne sec 56, T. R. Willis sur, Bend 6084 ft, Barnett 6402 ft, flow 1260 bbls, ½-in, perf 6122-62 ft, td 6432 ft.

Continental's Lewis 1-A, 2452 ft snl 517 ft wel E. T. Ry. sec 57, Bend 6084 ft, Barnett 6395 ft, flow 1349 bbls, ½-in, perf 6158-85 ft, td 6450 ft.

Wichita County: Magnolia's Goins 16, 320 ft snl 1020 ft wel blk 29, Red River VL sur, pump 1 bbl, td 1891 ft.

Magnolia's Goins 17, 320 snl 1020 ft ewl blk 29 Red River VL sur, pump 1 bbl, td 1877 ft.

Wichita County—K-M-A Ellenburger: J. D. Thweatt et al's Logan 1, 430 ft nsl 397 ft ewl blk 34, KWVFL, KMA 3976 ft, abnd 4473 ft.

Young County: L. T. Burns et al's Bloodworth 2, 990 ft snl 470 ft ewl TE&L Co. sec 223, abnd 1000 ft.

Elliott Production Co.-J. Nunnelee's Grantham 1, 467 ft nsl 440 ft ewl, J. R. Baker sur A-56, Bend 3497 ft, Marble Falls 4000 ft, Miss 4359 ft, Ellen 4491 ft, abnd 4518 ft.

Henry Zweifel et al's Hargraves 1, 660 ft out ne cor, L. H. Kimbrell sur A-2190, 12,000,000 gas, Bend perf 3919-44 ft, td 3980 ft.

Young County—Allar: Panhandle Ref. Co.'s Mayes 1-A, 467 ft out nw cor, R. K. Mayes sur A-1493, abnd 2794 ft.

NORTH TEXAS WELL DEEPENED

Wichita County — Airport: Consolidated's Kirzan 1, 495 ft out nw cor blk 43, Cherokee CSL, otd 4475 ft, Bend 5226 ft, Ellen 5336 ft, abnd 5408 ft.

NORTH TEXAS WILDCATS

Archer County—Failures: Bridwell Oil Co.'s Bridwell 1, 400 ft snl 950 ft wel lot 3, Word-Houssels subdiv, Bend 5422 ft, Barnett 5679 ft, Ellenburger 5960 ft, abnd 6038 ft.

A. R. Dillard et al's Herndon 1, ne ne nw S. P. Ry. 1, A-434, Bend 4955 ft, Miss 5232 ft, Ellenburger 5390 ft, abnd 5460 ft.

Cooke County—Failures: R. C. Lipscomb et al's Cannon 1, 700 ft n 2204 ft e of m/w/sw cor, J. F. Johns sur A-1569, abnd 1678 ft.

Texas Co.'s Moss 1, 330 ft snl 400 ft wel of 117-ac, H. Walker sur A-1082, abnd 2500 ft.

Jack County—Oil Discovery: Shell's O. J. Lester 1-A, 1268 ft nsl 990 ft ewl, McKinney-Williams sur A-435, elev 1160 ft, Bend 4568 ft, Barnett 5357 ft, Mississippi 5444 ft, flow 1968 bbls 47.2-gr, 2-in, 2000 gals acid 5458-5512 ft.

Wichita County—Failure: Bridwell Oil Co.'s Bridwell 2, 300 ft snl 800 ft wel AB&M sur A-595, abnd 1678 ft.

Young County—Failure: Bruce Sullivan et al's Perry 1, 467 ft nsl 933 ft wel TE&L Co. sec 708, abnd 1900 ft.

WYOMING

Park County—Frannie: Continental's Mau 1-E, se ne sw 25-58n-98w, flow 10 bbls hr 17-gr, Madison 3206 ft.

Park County — Oregon Basin: Yale Oil Corp.'s Owens A-3, ne sw se 29-52n-100w, pump 155 bbls, 5½-in 3775 ft, Embar 3420 ft, td 3375 ft.

Natrona County—Cole Creek: General Pet. Corp.'s Govt. 42, nw sw nw 21-35n-77w, pump 345 bbls, Lakota 7984 ft, 5½-in 7984 ft, Dakota 7954 ft, td 8023 ft.

WYOMING WILDCATS

Big Horn County—Garland Discovery: Ohio Oil Co.'s Ohio-Kinney-Coastal 5, nw sw sw 13-56n-98w, pump 135 bbls, Tensleep 4349 ft, 5½-in 4350 ft, td 4485 ft.

Big Horn County—Failure: Yale Oil Corp.'s Govt. 1, c se ne 33-55n-95w, Alkali Anticline district, abnd 3525 ft.

TEXAS PANHANDLE

Carson County: Skelly's Schafer 182, 440 ft out ne cor I&GN 196, blk 3, flow 227 bbls, shot 197 qts 3140-76 ft.

Gray County: Texas Co.'s Mayberry 4, 330 ft nsl 3257 ft ewl H&GN 11, blk A-6, pump 12 bbls oil, 25 bbls wtr, pay 2930-36 ft, td 2939 ft.

Hutchinson County: Cree & Hoover's Haile 14, 330 ft snl 450 ft ewl w½ E.L.Ry. 15, blk L, pump 137 bbls, shot 274 qts 2960-3011 ft.

Phillips' Yake 8, 6563 ft snl 330 ft ewl H&TC 36, blk 47, 6,600,000 gas, 210 lbs rp, 5000 gals acid perf 2400-98 ft, td 2908 ft, pb 2700 ft.

Moore County: Shamrock O&G Corp.'s Taylor 1, 2490 ft snl 2640 ft ewl sec 1, blk 1, J. Poitevent sur, 86,000,000 gas, 311 lbs rp, 8500 gals acid 2712-3107 ft.

PAGES 3079 THRU 3098
IN THE 1943-44
COMPOSITE CATALOG

One purpose...

the IMPROVEMENT of Metals

40-Page Reference Data Book on Forgings Available on Request

by Forging

For the *unpredictable emergency,* use forgings. This new Reference Data Book contains technical information on how to utilize forgings to *insure dependable performance* under a wide variety of operating conditions, and obtain a greater factor of safety, in all kinds of equipment and operating mechanisms for war, as well as peacetime, use. All phases from Forging Design to Forging Metallurgy are treated in this book. The factual data it contains on THE IMPROVEMENT OF METALS BY FORGING, provides dependable guidance for design engineers, metallurgists, production and management executives who must exercise good judgment in the selection and use of materials. Write for a copy of this book on your business letterhead.

DROP

THE STEEL IMPROVEMENT & FORGE CO.

FORGINGS

966 East 64th Street CLEVELAND, OHIO

G. P. M. TESTS
for settlements on
Gas-Distillate Operations

ASSOCIATED ENGINEERS
GAS LABORATORY
1912 WEST GRAY HOUSTON, TEXAS

PRECISION INSPECTION SERVICE
NON-DESTRUCTIVE INSPECTION
- **MAGNAFLUX**
- **X-RAY**
- **RADIUM**

PORTABLE FIELD EQUIPMENT

6006 NAVIGATION BLVD.,
W 6-6922 P. O. 1901 HOUSTON, TEXAS

1944 MAILING LISTS
of the
Oil Industry
OIL INDUSTRY MAILING LIST CO.,
909 Tulsa Loan Bldg.,
Tulsa 3, Okla.

An A.A.P.G. Book (1942)
Still meeting a strong demand
SOURCE BEDS OF PETROLEUM
By PARKER D. TRASK and
H. WHITMAN PATNODE

REPORT OF INVESTIGATION SUPPORTED JOINTLY BY THE AMERICAN PETROLEUM INSTITUTE AND THE GEOLOGICAL SURVEY OF THE UNITED STATES DEPARTMENT OF THE INTERIOR FROM 1931 TO 1941.

RESULTS OF A.P.I. RESEARCH COMMITTEE NO. 4. WORK DONE UNDER ADVISORY COMMITTEE COMPOSED OF R. F. BAKER, B. B. COX, F. R. CLARK, K. C. HEALD, W. B. HEROY, L. P. GARRETT, F. H. LAHEE, A. W. McCOY, H. D. MISER, R. D. REED, AND L. C. SNIDER.

"The main object of this study of lithified deposits has been to determine diagnostic criteria for recognizing source beds."

600 pages, with bibliographies and index.
72 figures, 152 tables. 6 x 9 inches.
$4.50, POSTPAID
THE AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS
BOX 979, TULSA 1, OKLAHOMA, U.S.A.

United States Wildcat Starts

CALIFORNIA

Kern County: Amerada's KCL J-1, se se ne 17-30-27, Gosford area, lcn.

Merced County: Obispo & Brookshire Oil Co.'s Stone 1, se se ne 1-12-11, Dos Palos area, rig.

San Luis Obispo County: Los Nietos Co.'s Lowther 1, 400 ft s 18 ft e nly cor Lot 66, Oak Park Tr., Arroyo Grande area, mim.

COLORADO

Rio Blanco County: Newton Oil Co.'s Gentry 1-D, ne sw Lot 8 3-1n-102w, Rangely field, Dakota test, lcn.

Wasatch Oil Refg. Co. & Idaho Refg. Co.'s McLaughlin 1, nw nw ne 32-2n-102w, Rangely field, Weber test, ru.

ILLINOIS

Bond County: Texas Co.'s Enloe 1, se se nw 6-4n-2w, lcn.

Clay County: Texas Co.'s Kemmer 1, nw ne se 34-4n-6e, lcn.

Edwards County: Superior's Lambert 1, nw se 31-1s-11e, lcn.

Effingham County: Kingwood Oil et al's Danks 1, se se se 25-6n-4e, lcn.

Luttrell et al's Wallace 1, ne nw nw 24-6n-5e, lcn.

Franklin County: Magnolia's Hall Unit 1, nw ne nw 14-5s-3e, dr 2220 ft.

Hamilton County: Winkler et al's Garrison 1, ne nw nw 18-3s-7e, lcn.

Jefferson County: Heath et al's Hurst 1, se se nw 19-1s-3e, lcn.

Shelby County: Texas Co.'s Noffke 1, se nw 31-11n-6e, lcn.

Wayne County: Pure's Molt 1-A, sw se ne 31-1n-8e, lcn.

Williamson County: Superior's Pulley et al 1, se ne nw 13-9s-3e, lcn.

INDIANA

Gibson County: Skiles et al's Hill 1, se sw se 7-4s-13w, dr 2546 ft.

Posey County: Carter's Korsmeier 1, sw sw sw 2-6s-12w, lcn.

Frontier Fuel Oil's Hill 1, se se sw 18-7s-12w, lcn.

KANSAS

Barber County: Phillips' Marjorie 1, c nw se 31-30s-13w, rur.

Barton County: Sohio's Breford 1, ne nw nw 24-16s-11w, lcn.

Dickinson County: Bay Pet.'s Reiff 1, se sw nw 8-16s-1e, mim.

Wolf Creek's Walker 1, nw nw se 1-13s-1e, dr 710 ft.

Leavenworth County: Miller's Schwarzer 1, c n nw se 21-9s-21e, dr 842 ft.

Lincoln County: Dickey Oil's Eckart 1, swc 21-11s-7w, lcn.

Marion County: Greenland's Stegeman 1, c wl sw nw 1-17s-2e, mim.

Phillips' Tinker 1, se se ne 13-18s-17w, dr 317 ft.

Reno County: Helmerich & Payne et al's Sheele 1, c nw sw 12-25s-5w, dr 198 ft.

Rooks County: Stanolind's Peterson 1, ne nw nw 23-8s-19w, lcn.

KENTUCKY

Ohio County: Producers Pipe Line's Renfrow 1, 23-M-36, lcn.

NORTH LOUISIANA

Lincoln Parish: California Co.'s Norris 1, 15-18n-1w, lcn.

SOUTH LOUISIANA

Terrebonne Parish: Sun's Blanchard Pool 1, 4469 s 500 w of ne cor 43-15s-16e, 10,000-ft test.

MICHIGAN

Arenac County: Don Rayburn's Consumers 1, s½ se nw 25-20n-3e, lcn.

Mecosta County: Carter Oil Co.'s Flashs 1, sw ne se 9-14n-7w, rig.

Newaygo County: Sun's Consumers 1, n½ ne nw 14-13n-11w, lcn.

Pure's Peterson 1, e½ se nw 16-11n-11w, dr.

Van Buren County: Alton C. Murray's Elliott 1, ne nw nw 14-4s-14w, lcn.

NEW MEXICO

Eddy County: Martin Yates, Jr., et al's A. A. Kaiser 1, ne nw nw 29-18s-27e, lcn.

Lea County: DeKalb Agricultural Assn.'s Stovall 1, c ne sw 8-20s-38e, lcn 7500-ft test.

WEST TEXAS

Andrews County: Cities Service Oil Co.'s University (Empire-Southern) 1-L, c ne se sec 10, blk 14, lcn 7500-ft Clear Fork test.

Borden County: Thomas W. Doswell et al's G. O. Thompson 1, c ne ne T&P Ry. 22, blk 32, T-6-N, lcn 5000-ft test.

Gaines County: Stanolind's T. S. Riley 1, c sw ne D&W 79, blk H, lcn 6500-ft Clear Fork test.

Howard County: Herman & Geo. R. Brown and J. C. Karcher's J. C. Caldwell 1, c nw ne T&P 32, blk 32, T-3-N, lcn 6000-ft cable tool test.

Lynn County: Phillips' Bartley 1, 683 ft sn, 673 ft ewl E. L. & R. R. sec 1372, blk 1, lcn 7000-ft test.

Pecos County: J. L. Cooper et al's Iowa Realty Co. 1, c w¼ of w¼ of s¼ H&GN Ry. 61, blk 10, top Rustler 385 ft, dr 700 ft.

Debs Patillo et al's Crockett-Sun 1, c n¼ of n¼ of e¼ H&GN 58, blk 10, lcn 1700-ft test.

Robt. M. Turpin et al's H. J. Eaton 1, 330 ft fr nel 990 ft fr sel of e½ of se¼ H&TC 22, blk 3, twin to Ellenburger failure, lcn shallow test.

WEST CENTRAL TEXAS

Jones County: New Idria Quicksilver Mining Co.'s Kelso 1, 330 ft out of middle 50 ac of T&P 25, blk 17, lcn 2600-ft test.

SOUTHWEST TEXAS

Brooks County: Sun's J. D. Sullivan et al, 8300 fr wl 19,000 fr sl, El Tule A. Garcia Gr. on 15,732-ac lse, lcn 8500-ft test.

Duval County: M. E. Davis's Atlee Parr, 5492 s alg el Parr Rch & Gr fr se cor lot 12, W. E. Price subdvn th 2550 w at ra to lcn, in San Andres A. Garcia Gr A-657, mir.

Jim Hogg County: Arkansas Fuel Oil Co.'s L. J. Spoonts 2, 16,608 fr nl 10,271 fr wl Agua de Nueva de Arriba J. M. Ramirez Gr, 5000-ft test.

Webb County: Dulup Oil Co.'s A. M. Bruni 2, 330 fr wl 1260 fr sl of blk 46 in sw por of Albercas de Arriba Gr, elev 838 ft, lcn 1800-ft test.

LOWER TEXAS COAST

Karnes County: Sohio's Radford 1, 990 fr wl 1650 fr nely nel of 295-ac lse, lcn 8500-ft Wilcox test.

Kleberg County: Sam Wilson, Jr.'s Robt. Kleberg 1, 467 fr n&el of 480-ac lse in sec

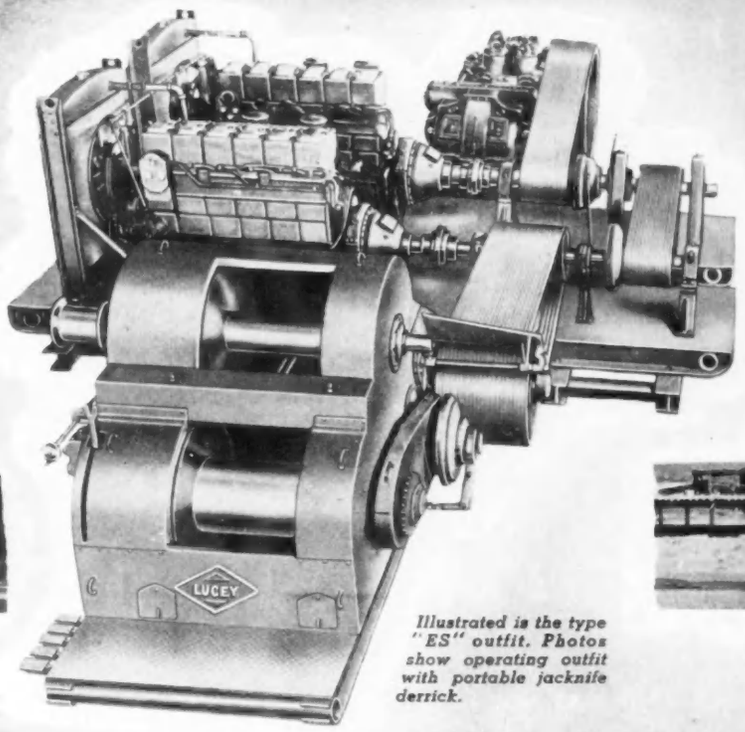
Standco
NO-SMOKE
STANDCO BRAKE LINING
for the easiest brake known. It "feeds off" evenly. Standco never scores brake rims. See page 2808 Composite Catalog.
Standco Brake Lining Co.
HOUSTON

William M. Barret, Inc.
Consulting Geophysicists
Specializing In Magnetic Surveys
Contracts accepted for domestic and foreign projects, using the most improved instrumental and interpretative technique
GIDDENS-LANE BUILDING
SHREVEPORT, LOUISIANA

HOUSTON LABORATORIES
Analytical and Consulting Chemist
Podbielniak Gas Analysis
Oil Field Brines, Waters and Cores
Complete Evaluation of Crude Oils
Long Distance 267, Box 132, Houston, Tex.

THE FORT WORTH LABORATORIES
Analysis of oil field brines, cores, gas, oil and minerals. Field gas testing. R. H. Fash, Vice President; Long Distance 138
823½ Monroe Street, Fort Worth, Texas

LUCEY SLIM-HOLE DRILLING OUTFITS



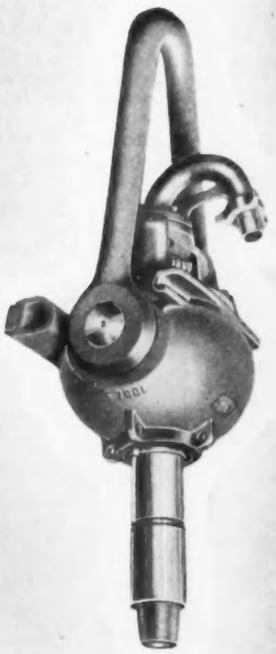
Illustrated is the type "ES" outfit. Photos show operating outfit with portable jackknife derrick.

LUCEY SLIM-HOLE Drilling Outfits are built in 3 sizes and capacities:

TYPE "B" . . 2,500 ft. TYPE "C" . . 5,000 ft.

TYPE "E" . . 7,500 ft.

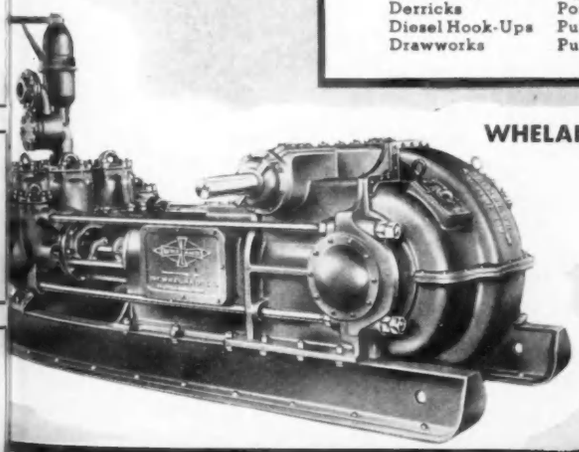
"S" indicates Sand Reel is built in as part of Drawworks unit. (Example: Type "ES")

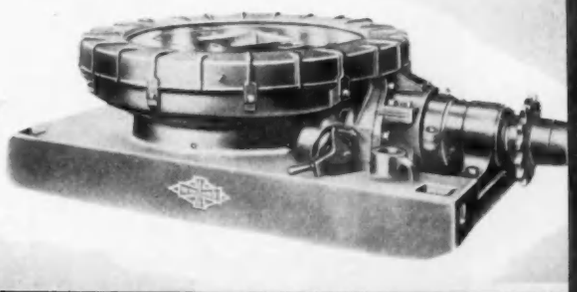


OIL WELL LUCEY SUPPLIES

Boilers	Drift Recorders	Pumps, Steam	Tanks, Steel
Boiler Casings	Drill Pipe	Rectorheads	Tongs
Burners	Drilling Lines	Rectorseal	Tool Joints
Cable Tools	Elevators	Rock Bits	Totco Instruments
Casing	Engines	Rotaries	Trailers
Casing Lines	Fishing Tools	Sand Lines	Traveling Blocks
Chains	Line Pipe	Separators	Tubes, Boiler
Crown Blocks	Pipe Cleaners	Slim Hole Outfits	Tubing
Derricks	Portable Outfits	Sucker Rods	Turbo Generators
Diesel Hook-Ups	Pull Rods	Swabs	Valves
Drawworks	Pumps, Power	Swivels	Wire Rope

WHELAND-LUCEY DRILLING EQUIPMENT





LUCEY EXPORT CORPORATION

233 BROADWAY . . . NEW YORK 7, N. Y.

Broad Street House, London, E. C. 2, England • 811 Sterling Building, Houston, Texas • Calle Defensa 320, Buenos Aires, Argentina

10, King addn 3, Pasadize A. Gutierrez Gr, 7500-ft test, ru.

Nueces County: Stanolind's C. W. Kerrl, 660 fr sl 1677 fr wl of lot 10, Wade's Riverside subdvn, J. L. Herrera Gr, lcn 8000-ft test.

Victoria County: Kingswood Oil Co.'s Addie Wilden 1, 660 fr ne&nwl 183.89-ac lse, Victoria 4-Lge town Gr, in blk 1, 4900-ft test, ru.

TEXAS GULF COAST

Brazoria County: G. S. Hinkle's H. L. Trammell 1, 660 fr s 330 fr el of tr 29 on 40-ac unit of 151-ac lse, David Talley sur, lcn 6600-ft test.

Chambers County: Wynn Crosby Drlg. Co. et al's Mayes White 1, 660 fr m/nly nl 660 fr m/ely wl of sur, mlm.

Fayette County: M. E. Davis' Ray Kusey 1, 1320 fr w 330 fr sl 164-ac tr, J. G. Sargeant sur 22, 8000-ft test.

SOUTH CENTRAL TEXAS

Bexar County: J. A. Caldwell's Jessie Conaway 1, 486 fr wl 450 fr sl 128-ac tr, J. H. Lucas sur 54, lcn 1500-ft test.

Caldwell County: F. J. Adams' G. G. Moore 1848 fr s&el 60-ac lse, Dorothy Benton sur, elev 470 ft, lcn.

Guadalupe County: W. H. Schafer, Tr.'s Christian Weber 1, 260 fr nl 1330 fr sl 207-ac tr, Guadalupe Torres sur, Edward lime 1421 ft, sd.

NORTH TEXAS

Archer County: Guy J. Scholl et al's C. Benson 1, 1120 ft nsl 200 ft ewl blk 13, Jefferson CSL, lcn 1200-ft test.

Clay County: Bridwell Oil Co.'s Bridwell 2, 467 ft out sw cor blk 27, Word & Halsell subdiv, lcn Ellenburger test.

Wichita County: Panhandle Ref. Co.'s E. B. Madden 1, 660 ft snl 330 ft wel blk 8, J. A. Kemp subdiv of Wm. Mayer sur A-193, lcn 5500-ft test.

Wilbarger County: Humble's McDaniel 1, c ne ne H&TC Ry. 56, blk 15, lcn 6000-ft Ellenburger test.

Joe A. Worsham et al's M. H. Lewis 1, c nw ne H&TC 10, blk 9, lcn 4500-ft test.

Young County: L. T. Burns et al's M. M. Burris 1, 660 ft nsl 300 ft wel TE&L Co. sec 205, lcn 5100-ft Ellenburger test.

L. T. Burne et al's J. O. Winkler 1, 1000 ft snl 1200 ft wel TE&L Co. sec 405, lcn 1500-ft test.

WYOMING

Niobrara County: Continental's Wright 1, nw sw nw 25-36n-64w, East Lance Creek dist, ru.

CHARLES S. LARKEY, engineer with Sinclair Prairie Oil Company, has been named president of the Oklahoma Society of Professional Engineers, succeeding M. J. Fuller who is in the Army. D. H. Jones, vice president of the society, has also resigned.

Squeaks from the Bull Wheel

GI Troubles

"Ya look worried, soldier, what's the matter?"

"Aw, there's so many women in uniform these days, we GI's have to wait to see whether we should salute or whistle?"

Right

"I'll bet you think twice before leaving that wife of yours alone in the evenings."

"I'll say! First I have to think up an excuse for going out, and then a reason why she can't come with me."

Yes, They Are

Professor: "You don't know the first thing about syntax."

Student: "Lord, don't tell me they're taxing that."

Promises

"You promised me before we were married that you would never look at another woman."

"I thought you understood it was only a campaign promise."

Not Bargained For

A soldier on the march felt something in his boot. His toe became painful and he was limping badly by the time he got back to camp. He took off his boot and sock to bathe his blistered foot and found a pellet of paper lodged in the toe of the sock, on which was written, "God bless the soldier who wears these socks!"

True to His Trust

"Look here, Bill, what do you mean by shooting at me? I ain't got no quarrel with you."

"You had a feud with Ben Walker, didn't you?"

"But Ben's dead."

"Well, I'm his executor."

A Variation

"Who was the lady I seen you out with last night?"

"I wasn't out, I was just dozing."

Sandy's Solution

A Scot who had ordered some meat from the butcher for his cat came rushing in later to cancel the order.

"What's the matter?" asked the butcher. "Lost your cat?"

"No," answered Sandy, "he's just caught a mouse."

Poor Fish

"What lovely salmon!"

"That's not salmon—that's cod blushing at the price they're asking for it."

Not Wild

"Son, who is this wild woman you are running around with?"

"Aw, Dad, she ain't wild. Anybody can pet her."

A Virtue

"Why do people say 'as smart as a steel trap'?" asked the talkative one. "I don't see anything particularly smart about a steel trap."

"A steel trap is smart," responded the old grouch, "because it knows the right time to shut up."

And there was silence—for a time.

Only Water Missing

A traveler in the middle of the Sahara desert came across a man in a bathing suit.

"Where on earth are you going?" he asked in amazement.

"Going swimming," replied the bathing-suited one.

"But you're a hundred miles from the sea."

"Yep; wide beach, ain't it?"

Not Yet

Two little negro boys were loitering on a street corner, when one said to the other: "How old is you?"

"Ah don' know," said the first.

"You don' know how old you is?"

"Nope."

"Does women botha' you?"

"Nope."

"You is fo'."

Must Mean Rain

"Put down 'rain' for today."

"Are you sure, sir?"

"Yes. I lost my umbrella, I'm planning to play golf today, the roof has not been fixed yet, and my wife is giving a lawn party."

Earliest Use

"Can you give me an example of a commercial appliance used in ancient times?"

"Yes, sir; the loose leaf system used in the Garden of Eden."

Covered

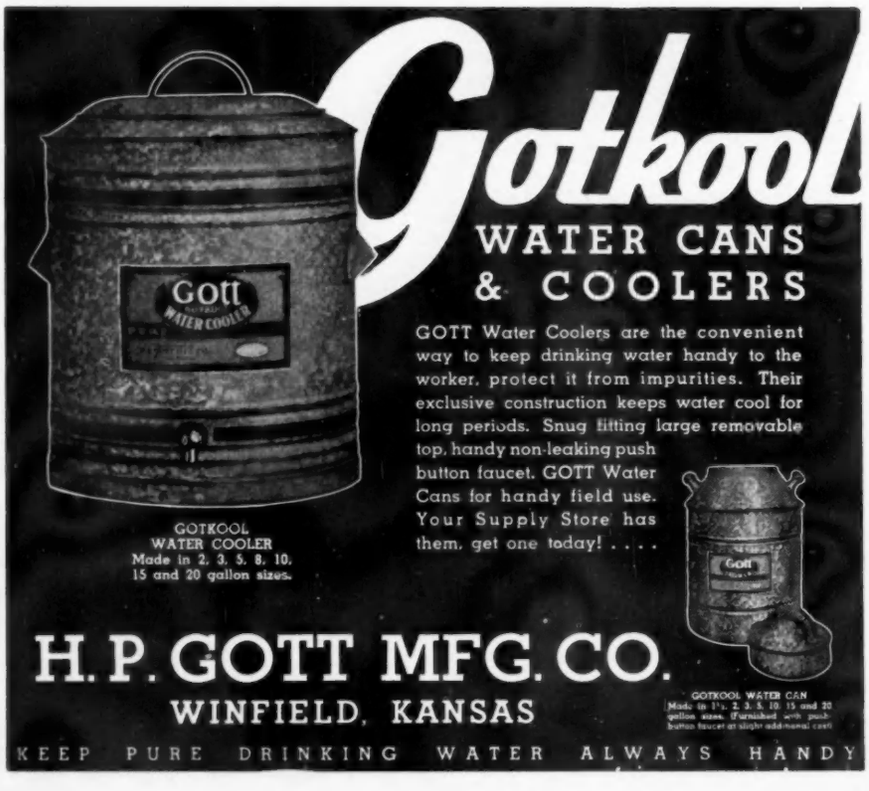
"Shoots a dollah! Fade me, somebody, fade me!"

"Fade you — Black Boy, you're bleached."

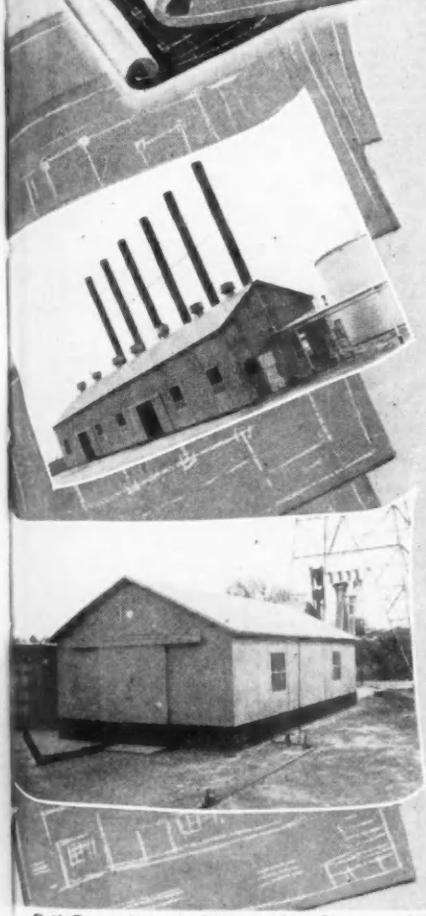
Help Her at Least

"No pie for me, soldier, I've gotta watch my figure."

"Aw, take just a small hunk. I'll watch your figure."


Gotkool
WATER CANS
& COOLERS
Gott
WATER COOLER
GOTKOOL
WATER COOLER
Made in 2, 3, 5, 8, 10,
15 and 20 gallon sizes.
GOTT Water Coolers are the convenient way to keep drinking water handy to the worker, protect it from impurities. Their exclusive construction keeps water cool for long periods. Snug fitting large removable top, handy non-leaking push button faucet. GOTT Water Cans for handy field use. Your Supply Store has them, get one today! . . . .
Gott
GOTKOOL WATER CAN
H. P. GOTT MFG. CO.
WINFIELD, KANSAS
KEEP PURE DRINKING WATER ALWAYS HANDY

YOUR SPECIFICATIONS... AND BRADEN BUILDINGS



Braden offers the experience accumulated in twenty years of designing and manufacturing many thousands of Sectional Steel Buildings for the Oil Industry.

From *your specifications* Braden engineers will design steel buildings that exactly meet your particular requirements, complete including craneway, crane and hoist equipment. Braden Sectional Steel Buildings have the *stamina* of permanent structures, with the *added advantage* of quick dismantling and re-erection when required at another location.

The large number of Braden Buildings that are being used are proof of their suitability to meet the specifications of the Oil Industry.

BRADEN STEEL CORPORATION

1007 East Admiral Blvd. **Tulsa 3, Oklahoma**

Subsidiary of MOORLANE COMPANY

Gulf Coast Branch Office: 1314 Esperson Bldg., Houston 2, Tel. C-4-5918. *Representatives:* 1815 South Baltimore Ave., Kansas City 8, Mo., Tel. Victor 2618; 1101-05 Grant Street, Amarillo, Texas, Tel. 2-5262; 902 Central Bldg., Wichita 2, Kansas, Tel. 5-1965.

BRADEN STEEL BUILDINGS

ORBIT VALVES

The Valves that can "Take It"

ORBIT MASTER VALVE

The Orbit Master Valve is quick opening—has easy operation and a positive shutoff. A welded bonnet valve—insurance against possible gasket leaks.

•

YOUR ORBIT VALVES

will last for the duration. Meanwhile, if you have any questions regarding their care or maintenance, write us.

•

OIL WELL IMPROVEMENTS CO.

SINCE 1912

TULSA, OKLAHOMA

Men in the Industry's News

CHESTER F. YUNKER, Del Amo Estate, has been elected president of California Stripper Well Association. Other officers are Edwin P. Crail, Crail Brothers, E. F. Demond, Exter Oil Company, and V. R. G. Wilbur, vice presidents; Thomas H. Work, Norden Corporation, secretary-treasurer; and Richard Fenton, executive vice president.

R. O. FRAME has been appointed division superintendent of the Southwest Texas Division of Humble Oil & Refining Company to take the place of A. O. Behling, who died recently at Corpus Christi.

PAUL F. BARNHART has been promoted to general manager of drilling, production and engineering operations of the firm of Frank and George Frankel, oil producers of Houston. Barnhart joined the company early in 1942, and has been actively engaged in drilling and production operations in numerous fields throughout Texas, Arkansas, Louisiana and Mississippi.

JOHN M. SCROGIN, former geologist for Phillips Petroleum Company at Houston, has established a Permian Basin operating office at Midland, Texas, for the American Trading and Production Corporation.

GORDON GRAY has been promoted to assistant West Texas-New Mexico division land man for Humble Oil & Refining Company with headquarters at Midland, having previously served the company at New Orleans.

JOHN H. ELLIOTT, for the past four years secretary of Landis Machine Company, Waynesboro, Pennsylvania, has been appointed general manager, and will continue his duties as secretary.

D. O. PUGH, sales and service engineer for the oil tool division of Byron Jackson Company, recently has transferred his headquarters to Tulsa. In addition to contacting the Tulsa offices of various companies, he will make regular trips to cover the Kansas, Oklahoma and North Central Texas areas.

C. C. BROWN has been appointed director of production, District 2, succeeding R. B. Kelly who resigned to return to the industry. Brown joined PAW in 1942 as assistant director at Chicago. In November, 1942, he was transferred to Tulsa, where he served as assistant director of production until his present appointment, which again moves him to Chicago.

ACE ELLIOTT has joined Oil Center Tool Company, Houston, as representative of the company's sales department in Southwest Texas, with headquarters at Alice, the company has announced. Elliott has been identified with the oil industry in both drilling-production and equipment sales capacities for more than 16 years, and is particularly well known in the Gulf Coast area.

JOHN V. McMAHON, 62, former president of Sinclair Oil & Gas Company, died in Tulsa March 27, and rites were held in Ellicottville, New York. He was with Sinclair from 1919 until 1926, and previously was vice president of Gypsy Oil Company. In recent years he has acted in an advisory capacity to Sinclair Prairie Oil Company.

Advertisers' Index

*Indicates detailed information on products and services included in 1943-44 edition of Composite Catalog of Oil Field and Pipe-Line Equipment.

*Acme Fishing Tool Co. 80
American Association of Petroleum Geologists 92
*American Cable Division, American Chain & Cable Co. II Cover
*American Steel & Wire Co. 5
Associated Engineers 92
Theo. Audel & Co. 90
*Axelson Manufacturing Co. 72
*Baash-Ross Tool Co. 53
*Wm. M. Barret, Inc. 92
*Bethlehem Steel Co. 63
*Braden Steel Corp. 95
*Broderick & Bascom Rope Co. I Cover
Brown Oil Tools, Inc. 44
*Cameron Iron Works, Inc. 33
Columbia Steel Co. 5
Continental Oil Co. 18
*Fred E. Cooper 59
Crane Co. 13
*Cummins Engine Co. 48
DeWitt Hotels 74
E. I. Du Pont de Nemours & Co. 87
*E. H. Edwards Co. 61
*Emsco Derrick & Equipment Co. 43
Fort Worth Laboratories 92
*Gardner-Denver Co. 75
*Gaso Pump & Burner Manufacturing Co. 39
*Gatke Corp. 89
*The Goodyear Tire & Rubber Co. 51
*H. P. Gott Manufacturing Co. 94
*Grizzly Manufacturing Co. 77
*Hercules Powder Co. 7
Houston Laboratories 92
*Hughes Tool Co. IV Cover
*International Harvester Co. 79
The International Nickel Co., Inc. Insert, Opposite 9
Interstate Drop Forge Co. 37
*The S. M. Jones Co. 78
*Justrite Manufacturing Co. 89
*Kerotest Manufacturing Co. 45
*Keuffel & Esser Co. 86
Ladish Drop Forge Co. 11
Landis Machine Co. 4
*Larkin Packer Co. 55
*A. Leschen & Sons Rope Co. 41
*Link-Belt Co. 31
A. M. Lockett & Co. 86
*Lucey Export Corp. 93
Macklin Co. 64
Marmon-Herrington Co. 19
*Mission Manufacturing Co. 66- 67
*The National Supply Co. 34- 35
Norvell-Wilder Supply Co. 46- 47
Oil Industry Mailing List Co. 92
*Oil Well Improvements Co. 96
*Oil Well Supply Co. 2- 3
*Otis Pressure Control, Inc. 80
*The Parkersburg Rig & Reel Co. 83
*Patterson-Ballagh Corp. 85
*Pattin Brothers Division, Acme Fishing Tool Co. 80
*Pelican Well Tool & Supply Co. 76
Petroleum Electric Power Association 68
Plymouth Cordage Co. 12
Precision Inspection Service 92
*Raybestos-Manhattan, Inc. 84
*Reed Roller Bit Co. 1
Republic Steel Corp. 56- 57
*The Ridge Tool Co. 8
*SKF Industries, Inc. 6
*Security Engineering Co. Insert, opposite 8
Seismograph Service Corp. 20
South Chester Tube Co. 10
*Southern Mill & Manufacturing Co. 15
*Sperry-Sun Well Surveying Co. 72
Standard Oil Company of California 14
*Standco Brake Lining Co. 92
The Steel Improvement & Forge Co. 91
Sterling Packing & Gasket Co. 44
Texas Electric Steel Casting Co. 17
*Thornhill-Craver Co. 44
*Tuboscope III Cover
*United States Rubber Company 73
United States Steel Corp. 2-3 and 5
Warner & Swasey Co. 22
*Waukesha Motor Co. 9
*Western Gear Works 82
*Wheeling Machine Products Co. 90
*Wickwire Spencer Steel Co. 16
Williams Brothers Corp. 65
*Wisconsin Motor Corp. 76